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LIFE OF GALILEO:

WITH ILLUSTRATIONS OF THE ADVANCEMENT OF EXPERIMENTAL PHILOSOPHY.

CHAPTER I.

Introduction.

THE knowledge which we at present possess of the phenomena of nature and of their connection has not by any means been regularly progressive, as we might have expected, from the time when they first drew the attention of mankind. Without entering into the question touching the scientific acquirements of eastern nations at a remote period, it is certain that some among the early Greeks were in possession of several truths, however acquired, connected with the economy of the universe, which were afterwards suffered to fall into neglect and oblivion. But the philosophers of the old school appear in general to have confined themselves at the best to observations; very few traces remain of their having instituted *experiments*, properly so called. This putting of nature to the torture, as Bacon calls it, has occasioned the principal part of modern philosophical discoveries. The experimentalist may so order his examination of nature as to vary at pleasure the circumstances in which it is made, often to discard accidents which complicate the general appearances, and at once to bring any theory which he may form to a decisive test. The province of the mere observer is necessarily limited: the power of selection among the phenomena to be presented is in great measure denied to him, and he may consider himself fortunate if they are such as to lead him readily to a knowledge of the laws which they follow.

Perhaps to this imperfection of method it may be attributed that natural philosophy continued to be stationary, or even to decline, during a long series of ages, until little more than two centuries ago. Within this comparatively short period it has rapidly reached a degree of perfection so different from its former degraded state, that we can hardly institute any comparison between the two. Before that epoch, a few insulated facts, such as might first happen to be noticed, often inaccurately observed and always too hastily generalized, were found sufficient to excite the naturalist's lively imagination; and having once pleased his fancy with the supposed fitness of his artificial scheme, his perverted ingenuity was thenceforward employed in forcing the observed phenomena into an imaginary agreement with the result of his theory; instead of taking the more rational, and it should seem, the more obvious, method of correcting the theory by the result of his observations, and considering the one merely as the general and abbreviated expression of the other. But natural phenomena were not then valued on their own account, and for the proofs which they afford of a vast and beneficent design in the structure of the universe, so much as for the fertile topics which the favourite mode of viewing the subject supplied to the spirit of scholastic disputation: and it is a humiliating reflection that mankind never reasoned so ill as when they most professed to cultivate the art of reasoning. However specious the objects, and alluring the announcements of this art, the then prevailing manner of studying it curbed and corrupted all that is free and noble in the human mind. Innumerable fallacies lurked every where among the most generally received opinions, and crowds of dogmatic and self-sufficient pedants fully justified the lively definition, that "logic is the art of talking unintelligibly on things of which we are ignorant."*

The error which lay at the root of the philosophy of the middle ages was this:—from the belief that general laws and universal principles might be discovered, of which the natural phenomena were *effects*, it was thought that the proper order of study was, first to detect the general *cause*, and then to pursue it into its consequences; it was considered absurd to begin with the effect instead of the cause; whereas the real choice lay between proceeding from particular facts to general facts, or from general facts to particular facts; and it was under this misrepresentation of the real question that all the sophistry lurked. As soon as it is well understood that the general *cause* is no other than a single fact, common to a great number of phenomena, it is necessarily perceived that an accurate scrutiny of these latter must precede any safe reasoning with respect to the former. But at the time of which we are speaking, those who adopted this order of reasoning, and who began their inquiries by a minute and sedulous investigation of facts, were treated with disdain, as men who degraded the lofty name of philosophy by bestowing it upon mere mechanical operations. Among the earliest and noblest of these was Galileo.

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* Ménage.

It is common, especially in this country, to name Bacon as the founder of the present school of experimental philosophy; we speak of the Baconian or inductive method of reasoning as synonimous and convertible terms, and we are apt to overlook what Galileo had already done before Bacon's writings appeared. Certainly the Italian did not range over the circle of the sciences with the supreme and searching glance of the English philosopher, but we find in every part of his writings philosophical maxims which do not lose by comparison with those of Bacon; and Galileo deserves the additional praise, that he himself gave to the world a splendid practical illustration of the value of the principles which he constantly recommended. In support of this view of the comparative deserts of these two celebrated men, we are able to adduce the authority of Hume, who will be readily admitted as a competent judge of philosophical merit, where his prejudices cannot bias his decision. Discussing the character of Bacon, he says, "If we consider the variety of talents displayed by this man, as a public speaker, a man of business, a wit, a courtier, a companion, an author, a philosopher, he is justly the object of great admiration. If we consider him merely as an author and philosopher, the light in which we view him at present, though very estimable, he was yet inferior to his contemporary Galileo, perhaps even to Kepler. Bacon pointed out at a distance the road to true philosophy: Galileo both pointed it out to others, and made himself considerable advances in it. The Englishman was ignorant of geometry: the Florentine revived that science, excelled in it, and was the first that applied it, together with experiment, to natural philosophy. The former rejected with the most positive disdain the system of Copernicus: the latter fortified it with new proofs derived both from reason and the senses."*

If we compare them from another point of view, not so much in respect of their intrinsic merit, as of the influence which each exercised on the philosophy of his age, Galileo's superior talent or better fortune, in arresting the attention of his contemporaries, seems indisputable. The fate of the two writers is directly opposed the one to the other; Bacon's works seem to be most studied and appreciated when his readers have come to their perusal, imbued with knowledge and a philosophical spirit, which, however, they have attained independently of his assistance. The proud appeal to posterity which he uttered in his will, "For my name and memory, I leave it to men's charitable speeches, and to foreign nations, and the next ages," of itself indicates a consciousness of the fact that his contemporary countrymen were but slightly affected by his philosophical precepts. But Galileo's personal exertions changed the general character of philosophy in Italy: at the time of his death, his immediate pupils had obtained possession of the most celebrated universities, and were busily engaged in practising and enforcing the lessons which he had taught them; nor was it then easy to find there a single student of natural philosophy who did not readily ascribe the formation of his principles to the direct or remote influence of Galileo's example. Unlike Bacon's, his reputation, and the value of his writings, were higher among his contemporaries than they have since become. This judgment perhaps awards the highest intellectual prize to him whose disregarded services rise in estimation with the advance of knowledge; but the praise due to superior usefulness belongs to him who succeeded in training round him a school of imitators, and thereby enabled his imitators to surpass himself.

The biography of men who have devoted themselves to philosophical pursuits seldom affords so various and striking a succession of incidents as that

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of a soldier or statesman. The life of a man who is shut up during the greater part of his time in his study or laboratory supplies but scanty materials for personal details; and the lapse of time rapidly removes from us the opportunities of preserving such peculiarities as might have been worth recording. An account of it will therefore consist chiefly in a review of his works and opinions, and of the influence which he and they have exercised over his own and succeeding ages. Viewed in this light, few lives can be considered more interesting than that of Galileo; and if we compare the state in which he found, with that in which he left, the study of nature, we shall feel how justly an enthusiastic panegyric pronounced upon the age immediately following him may be transferred to this earlier period. "This is the age wherein all men's minds are in a kind of fermentation, and the spirit of wisdom and learning begins to mount and free itself from those drossie and terrene impediments wherewith it has been so long clogged, and from the insipid phlegm and *caput mortuum* of useless notions in which it hath endured so violent and long a fixation. This is the age wherein, methinks, philosophy comes in with a spring tide, and the peripatetics may as well hope to stop the current of the tide, or, with Xerxes, to fetter the ocean, as hinder the overflowing of free philosophy. Methinks I see how all the old rubbish must be thrown away, and the rotten buildings be overthrown and carried away, with so powerful an inundation. These are the days that must lay a new foundation of a more magnificent philosophy, never to be overthrown, that will empirically and sensibly canvass the phenomena of nature, deducing the causes of things from such originals in nature as we observe are producible by art, and the infallible demonstration of mechanics: and certainly this is the way, and no other, to build a true and permanent philosophy."*

CHAPTER II.

Galileo's Birth—Family—Education—Observation of the Pendulum—Pulsilogies — Hydrostatical Balance—Lecturer at Pisa.

GALILEO GALILEI was born at Pisa, on the 15th day of February, 1564, of a noble and ancient Florentine family, which, in the middle of the fourteenth century, adopted this surname instead of Bonajuti, under which several of their ancestors filled distinguished offices in the Florentine state. Some misapprehension has occasionally existed, in consequence of the identity of his proper name with that of his family; his most correct appellation would perhaps be Galileo de' Galilei, but the surname usually occurs as we have written it. He is most commonly spoken of by his Christian name, agreeably to the Italian custom; just as Sanzio, Buonarotti, Sarpi, Reni, Vecelli, are universally known by their Christian names of Raphael, Michel Angelo, Fra Paolo, Guido, and Titian.

Several authors have followed Rossi in styling Galileo illegitimate, but without having any probable grounds even when they wrote, and the assertion has since been completely disproved by an inspection of the registers at Pisa and Florence, in which are preserved the dates of his birth, and of his mother's marriage, eighteen months previous to it.*

His father, Vincenzo Galilei, was a man of considerable talent and learning, with a competent knowledge of mathematics, and particularly devoted to the theory and practice of music, on which he published several esteemed treatises. The only one which it is at present easy to procure—his Dialogue on ancient and modern music—exhibits proofs, not only of a thorough acquaintance with his subject, but of a sound and vigorous understanding applied to other topics incidentally discussed. There is a passage in the introductory part, which becomes interesting when considered as affording some traces of the precepts by which Galileo was in all probability trained to reach his preeminent station in the intellectual world. "It appears to me," says one of the speakers in the dialogue, "that they who in proof of any assertion rely simply on the weight of authority, without adducing any argument in support of it, act very absurdly: I, on the contrary, wish to be allowed freely to question and freely to answer you without any sort of adulation, as well becomes those who are truly in search of truth." Sentiments like these were of rare occurrence at the close of the sixteenth century, and it is to be regretted that Vincenzo hardly lived long enough to witness his idea of a true philosopher splendidly realized in the person of his son. Vincenzo died at an advanced age, in 1591. His family consisted of three sons, Galileo, Michel Angelo, and Benedetto, and the same number of daughters, Giulia, Virginia, and Livia. After Vincenzo's death the chief support of the family devolved upon Galileo, who seems to have assisted them to his utmost power. In a letter to his mother, dated 1600, relative to the intended marriage of his sister Livia with a certain Pompeo Baldi, he agrees to the match, but recommends its temporary postponement, as he was at that time exerting himself to furnish money to his brother Michel Angelo, who had received the offer of an advantageous settlement in Poland. As the sum advanced to his brother, which prevented him from promoting his sister's marriage, did not exceed 200 crowns, it may be inferred that the family were in a somewhat straitened condition. However he promises, as soon as his brother should repay him, "to take measures for the young lady, since she too is bent upon *coming out* to prove the miseries of this world." —As Livia was at the date of this letter in a convent, the last expression seems to denote that she had been destined to take the veil. This proposed marriage never took place, but Livia was afterwards married to Taddeo Galletti: her sister Virginia married Benedetto Landucci. Galileo mentions one of his sisters, (without naming her) as living with him in 1619 at Bellosguardo. Michel Angelo is probably the same brother of Galileo who is mentioned by Liceti as having communicated from Germany some observations on natural history.* He finally settled in the service of the Elector of Bavaria; in what situation is not known, but upon his death the Elector granted a pension to his family, who then took up their abode at Munich. On the taking of that city in 1636, in the course of the bloody thirty years' war, which was then raging between the Austrians and Swedes, his widow and four of his children were killed, and every thing which they possessed was either burnt or carried away. Galileo sent for his two nephews, Alberto and a younger brother, to Arcetri near Florence, where he was then living. These two were then the only survivors of Michel Angelo's family; and many of Galileo's letters about that date contain allusions to the assistance he had been affording them. The last trace of Alberto is on his return into Germany to the Elector, in whose service his father had died. These details include almost every thing which is known of the rest of Vincenzo's family.

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* Power's Experimental Philosophy, 1663.

* Erythræus, Pinacotheca, vol. i.; Salusbury's Life of Galileo, Nelli, Vita di Gal. Galilei.

Galileo exhibited early symptoms of an active and intelligent mind, and distinguished himself in his childhood by his skill in the construction of ingenious toys and models of machinery, supplying the deficiencies of his information from the resources of his own invention; and he conciliated the universal good-will of his companions by the ready good nature with which he employed himself in their service and for their amusement. It is worthy of observation, that the boyhood of his great follower Newton, whose genius in many respects so closely resembled his own, was marked by a similar talent. Galileo's father was not opulent, as has been already stated: he was burdened with a large family, and was unable to provide expensive instructors for his son; but Galileo's own energetic industry rapidly supplied the want of better opportunities; and he acquired, under considerable disadvantages, the ordinary rudiments of a classical education, and a competent knowledge of the other branches of literature which were then usually studied. His leisure hours were applied to music and drawing; for the former accomplishment he inherited his father's talent, being an excellent performer on several instruments, especially on the lute; this continued to be a favourite recreation during the whole of his life. He was also passionately fond of painting, and at one time he wished to make it his profession: and his skill and judgment of pictures were highly esteemed by the most eminent contemporary artists, who did not scruple to own publicly their deference to young Galileo's criticism.

When he had reached his nineteenth year, his father, becoming daily more sensible of his superior genius, determined, although at a great personal sacrifice, to give him the advantages of an university education. Accordingly, in 1581, he commenced his academical studies in the university of his native town, Pisa his father at this time intending that he should adopt the profession of medicine. In the matriculation lists at Pisa, he is styled Galileo, the son of Vincenzo Galilei, a Florentine, Scholar in Arts. It is dated 5th November, 1581. Viviani, his pupil, friend, and panegyrist, declares that, almost from the first day of his being enrolled on the lists of the academy, he was noticed for the reluctance with which he listened to the dogmas of the Aristotelian philosophy, then universally taught; and he soon became obnoxious to the professors from the boldness with which he promulgated what they styled his philosophical paradoxes. His early habits of free inquiry were irreconcileable with the mental quietude of his instructors, whose philosophic doubts, when they ventured to entertain any, were speedily lulled by a quotation from Aristotle. Galileo thought himself capable of giving the world an example of a sounder and more original mode of thinking; he felt himself destined to be the founder of a new school of rational and experimental philosophy. Of this we are now securely enjoying the benefits; and it is difficult at this time fully to appreciate the obstacles which then presented themselves to free inquiry: but we shall see, in the course of this narrative, how arduous their struggle was who happily effected this important revolution. The vindictive rancour with which the partisans of the old philosophy never ceased to assail Galileo is of itself a sufficient proof of the prominent station which he occupied in the contest.

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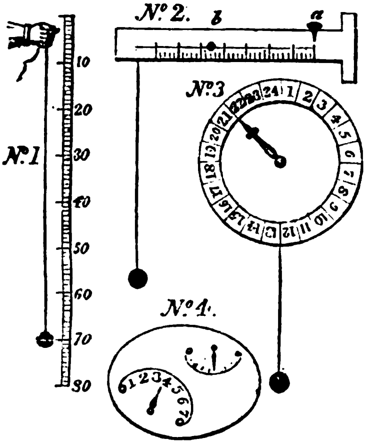
* De his quæ diu vivunt. Patavii, 1612.

Galileo's earliest mechanical discovery, to the superficial observer apparently an unimportant one, occurred during the period of his studies at Pisa. His attention was one day arrested by the vibrations of a lamp swinging from the roof of the cathedral, which, whether great or small, seemed to recur at equal intervals. The instruments then employed for measuring time were very imperfect: Galileo attempted to bring his observation to the test before quitting the church, by comparing the vibrations with the beatings of his own pulse, and his mind being then principally employed upon his intended profession, it occurred to him, when he had further satisfied himself of their regularity by repeated and varied experiments, that the process he at first adopted might be reversed, and that an instrument on this principle might be usefully employed in ascertaining the rate of the pulse, and its variation from day to day. He immediately carried the idea into execution, and it was for this sole and limited purpose that the first pendulum was constructed. Viviani tells us, that the value of the invention was rapidly appreciated by the physicians of the day, and was in common use in 1654, when he wrote.



Santorio, who was professor of medicine at Padua, has given representations of four different forms of these instruments, which he calls pulsilogies, (*pulsilogias*,) and strongly recommends to medical practitioners.* These instruments seem to have been used in the following manner: No. 1 consists merely of a weight fastened to a string and a graduated scale. The string being gathered up into the hand till the vibrations of the weight coincided with the beatings of the patient's pulse, the length was ascertained from the scale, which, of course, if great, indicated a languid, if shorter, a more lively action. In No. 2 the improvement is introduced of connecting the scale and string, the length of the latter is regulated by the turns of a peg at *a*, and a bead upon the string at *b* showed the measure. No. 3 is still more compact, the string being shortened by winding upon an axle at the back of the dial-plate. The construction of No. 4, which Santorio claims as his own improvement, is not given, but it is probable that the principal index, by its motion, shifted a weight to different distances from the point of suspension, and that the period of vibration was still more accurately adjusted by a smaller weight connected with the second index. Venturi seems to have mistaken the third figure for that of a pendulum clock, as he mentions this as one of the earliest adaptations of Galileo's principle to that purpose*; but it is obvious, from Santorio's description, that it is nothing more than a circular scale, the index showing, by the figure to which it points, the length of string remaining unwound upon the axis. We shall, for the present, postpone the consideration of the invention of pendulum clocks, and the examination of the different claims to the honour of their first construction.

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* Comment. in Avicennam. Venetiis, 1625.

At the time of which we are speaking, Galileo was entirely ignorant of mathematics, the study of which was then at a low ebb, not only in Italy, but in every part of Europe. Commandine had recently revived a taste for the writings of Euclid and Archimedes, and Vieta Tartalea and others had made considerable progress in algebra, Guido Ubaldi and Benedetti had done something towards establishing the principles of statics, which was the only part of mechanics as yet cultivated; but with these inconsiderable exceptions the application of mathematics to the phenomena of nature was scarcely thought of. Galileo's first inducement to acquire a knowledge of geometry arose from his partiality for drawing and music, and from the wish to understand their principles and theory. His father, fearful lest he should relax his medical studies, refused openly to encourage him in this new pursuit; but he connived at the instruction which his son now began to receive in the writings of Euclid, from the tuition of an intimate friend, named Ostilio Ricci, who was one of the professors in the university. Galileo's whole attention was soon directed to the enjoyment of the new sensations thus communicated to him, insomuch that Vincenzo, finding his prognostics verified, began to repent his indirect sanction, and privately requested Ricci to invent some excuse for discontinuing his lessons. But it was fortunately too late; the impression was made and could not be effaced; from that time Hippocrates and Galen lay unheeded before the young physician, and served only to conceal from his father's sight the mathematical volumes on which the whole of his time was really employed. His progress soon revealed the true nature of his pursuits: Vincenzo yielded to the irresistible predilection of his son's mind, and no longer attempted to turn him from the speculations to which his whole existence was thenceforward abandoned.

After mastering the elementary writers, Galileo proceeded to the study of Archimedes, and, whilst perusing the Hydrostatics of that author, composed his earliest work,—an Essay on the Hydrostatical Balance. In this he explains the method probably adopted by Archimedes for the solution of Hiero's celebrated question*, and shows himself already well acquainted with the true principles of specific gravities. This essay had an immediate and important influence on young Galileo's fortunes, for it introduced him to the approving notice of Guido Ubaldi, then one of the most distinguished mathematicians of Italy. At his suggestion Galileo applied himself to consider the position of the centre of gravity in solid bodies, a choice of subject that sufficiently showed the estimate Ubaldi had formed of his talents; for it was a question on which Commandine had recently written, and which engaged at that time the attention of geometricians of the highest order. Galileo tells us himself that he discontinued these researches on meeting with Lucas Valerio's treatise on the same subject. Ubaldi was so much struck with the genius displayed in the essay with which Galileo furnished him, that he introduced him to his brother, the Cardinal Del Monte: by this latter he was mentioned to Ferdinand de' Medici, the reigning Duke of Tuscany, as a young man of whom the highest expectations might be entertained. By the Duke's patronage he was nominated, in 1589, to the lectureship of mathematics at Pisa, being then in his twenty-sixth year. His public salary was fixed at the insignificant sum of sixty crowns annually, but he had an opportunity of greatly adding to his income by private tuition.

CHAPTER III.

Galileo at Pisa—Aristotle—Leonardo da Vinci—Galileo becomes a Copernican—Urstisius—Bruno—Experiments on falling bodies—Galileo at Padua—Thermometer.

No sooner was Galileo settled in his new office than he renewed his inquiries into the phenomena of nature with increased diligence. He instituted a course of experiments for the purpose of putting to the test the mechanical doctrines of Aristotle, most of which he found unsupported even by the pretence of experience. It is to be regretted that we do not more frequently find detailed his method of experimenting, than occasionally in the course of his dialogues, and it is chiefly upon the references which he makes to the results with which the experiments furnished him, and upon the avowed and notorious character of his philosophy, that the truth of these accounts must be made to depend. Venturi has found several unpublished papers by Galileo on the subject of motion, in the Grand Duke's private library at Florence, bearing the date of 1590, in which are many of the theorems which he afterwards developed in his Dialogues on Motion. These were not published till fifty years afterwards, and we shall reserve an account of their contents till we reach that period of his life.

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* Essai sur les Ouvrages de Leonard da Vinci. Paris, 1797.

* See Treatise on HYDROSTATICS.

Galileo was by no means the first who had ventured to call in question the authority of Aristotle in matters of science, although he was undoubtedly the first whose opinions and writings produced a very marked and general effect. Nizzoli, a celebrated scholar who lived in the early part of the 16th century, had condemned Aristotle's philosophy, especially his Physics, in very unequivocal and forcible terms, declaring that, although there were many excellent truths in his writings, the number was scarcely less of false, useless, and ridiculous propositions*. About the time of Galileo's birth, Benedetti had written expressly in confutation of several propositions contained in Aristotle's mechanics, and had expounded in a clear manner some of the doctrines of statical equilibrium.† Within the last forty years it has been established that the celebrated painter Leonardo da Vinci, who died in 1519, amused his leisure hours in scientific pursuits; and many ideas appear to have occurred to him which are to be found in the writings of Galileo at a later date. It is not impossible (though there are probably no means of directly ascertaining the fact) that Galileo may have been acquainted with Leonardo's investigations, although they remained, till very lately, almost unknown to the mathematical world. This supposition is rendered more probable from the fact, that Mazenta, the preserver of Leonardo's manuscripts, was, at the very time of their discovery, a contemporary student with Galileo at Pisa. Kopernik, or, as he is usually called, Copernicus, a native of Thorn in Prussia, had published his great work, De Revolutionibus, in 1543, restoring the knowledge of the true theory of the solar system, and his opinions were gradually and silently gaining ground.

It is not satisfactorily ascertained at what period Galileo embraced the new astronomical theory. Gerard Voss attributes his conversion to a public lecture of Mæstlin, the instructor of Kepler; and later writers (among whom is Laplace) repeat the same story, but without referring to any additional sources of information, and in most instances merely transcribing Voss's words, so as to shew indisputably whence they derived their account. Voss himself gives no authority, and his general inaccuracy makes his mere word not of much weight. The assertion appears, on many accounts, destitute of much probability. If the story were correct, it seems likely that some degree of acquaintance, if not of friendly intercourse, would have subsisted between Mæstlin, and his supposed pupil, such as in fact we find subsisting between Mæstlin and his acknowledged pupil Kepler, the devoted friend of Galileo; but, on the contrary, we find Mæstlin writing to Kepler himself of Galileo as an entire stranger, and in the most disparaging terms. If Mæstlin could lay claim to the honour of so celebrated a disciple, it is not likely that he could fail so entirely to comprehend the distinction it must confer upon himself as to attempt diminishing it by underrating his pupil's reputation. There is a passage in Galileo's works which more directly controverts the claim advanced for Mæstlin, although Salusbury, in his life of Galileo, having apparently an imperfect recollection of its tenor, refers to this very passage in confirmation of Voss's statement. In the second part of the dialogue on the Copernican system, Galileo makes Sagredo, one of the speakers in it, give the following account:—"Being very young, and having scarcely finished my course of philosophy, which I left off as being set upon other employments, there chanced to come into these parts a certain foreigner of Rostoch, *whose name, as I remember, was Christianus Urstisius*, a follower of Copernicus, who, in an academy, gave two or three lectures upon this point, to whom many flocked as auditors; but I, thinking they went more for the novelty of the subject than otherwise, did not go to hear him; for I had concluded with myself that that opinion could be no other than a solemn madness; and questioning some of those who had been there, I perceived they all made a jest thereof, except one, who told me that the business was not altogether to be laughed at: and because the man was reputed by me to be very intelligent and wary, I repented that I was not there, and began from that time forward, as oft as I met with any one of the Copernican persuasion, to demand of them if they had been always of the same judgment. Of as many as I examined I found not so much as one who told me not that he had been a long time of the contrary opinion, but to have changed it for this, as convinced by the strength of the reasons proving the same; and afterwards questioning them one by one, to see whether they were well possessed of the reasons of the other side, I found them all to be very ready and perfect in them, so that I could not truly say that they took this opinion out of ignorance, vanity, or to show the acuteness of their wits. On the contrary, of as many of the Peripatetics and Ptolemeans as I have asked, (and out of curiosity I have talked with many,) what pains they had taken in the book of Copernicus, I found very few that had so much as superficially perused it, but of those who I thought had understood the same, not one: and, moreover, I have inquired amongst the followers of the Peripatetic doctrine, if ever any of them had held the contrary opinion, and likewise found none that had. Whereupon, considering that there was no man who followed the opinion of Copernicus that had not been first on the contrary side, and that was not very well acquainted with the reasons of Aristotle and Ptolemy, and, on the contrary, that there was not one of the followers of Ptolemy that had ever been of the judgment of Copernicus, and had left that to embrace this of Aristotle;—considering, I say, these things, I began to think that one who leaveth an opinion imbued with his milk and followed by very many, to take up another, owned by very few, and denied by all the schools, and that really seems a great paradox, must needs have been moved, not to say forced, by more powerful reasons. For this cause I am become very curious to dive, as they say, into the bottom of this business." It seems improbable that Galileo should think it worth while to give so detailed an account of the birth and growth of opinion in any one besides himself; and although Sagredo is not the personage who generally in the dialogue represents Galileo, yet as the real Sagredo was a young nobleman, a pupil of Galileo himself, the account cannot refer to him. The circumstance mentioned of the intermission of his philosophical studies, though in itself trivial, agrees very well with Galileo's original medical destination. Urstisius is not a fictitious name, as possibly Salusbury may have thought, when alluding to this passage; he was mathematical professor at Bâle, about 1567, and several treatises by him are still extant. In 1568 Voss informs us that he published some new questions on Purbach's Theory of the Planets. He died at Bâle in 1586, when Galileo was about twenty-two years old.

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* Antibarbarus Philosophicus. Francofurti, 1674.

† Speculationum liber. Venetiis, 1585.

It is not unlikely that Galileo also, in part, owed his emancipation from popular prejudices to the writings of Giordano Bruno, an unfortunate man, whose unsparing boldness in exposing fallacies and absurdities was rewarded by a judicial murder, and by the character of heretic and infidel, with which his executioners endeavoured to stigmatize him for the purpose of covering over their own atrocious crime. Bruno was burnt at Rome in 1600, but not, as Montucla supposes, on account of his "Spaccio della Bestia trionfante." The title of this book has led him to suppose that it was directed against the church of Rome, to which it does not in the slightest degree relate. Bruno attacked the fashionable philosophy alternately with reason and ridicule, and numerous passages in his writings, tedious and obscure as they generally are, show that he had completely outstripped the age in which he lived. Among his astronomical opinions, he believed that the universe consisted of innumerable systems of suns with assemblages of planets revolving round each of them, like our own earth, the smallness of which, alone, prevented their being observed by us. He remarked further, "that it is by no means improbable that there are yet other planets revolving round our own sun, which we have not yet noticed, either on account of their minute size or too remote distance from us." He declined asserting that all the apparently fixed stars are really so, considering this as not sufficiently proved, "because at such enormous distances the motions become difficult to estimate, and it is only by long observation that we can determine if any of these move round each other, or what other motions they may have." He ridiculed the Aristotelians in no very measured terms—"They harden themselves, and heat themselves, and embroil themselves for Aristotle; they call themselves his champions, they hate all but Aristotle's friends, they are ready to live and die for Aristotle, and yet they do not understand so much as the titles of Aristotle's chapters." And in another place he introduces an Aristotelian inquiring, "Do you take Plato for an ignoramus—Aristotle for an ass?" to whom he answers, "My son, I neither call them asses, nor you mules,—them baboons, nor you apes,—as you would have me: I told you that I esteem them the heroes of the world, but I will not credit them without sufficient reason; and if you were not both blind and deaf, you would understand that I must disbelieve their absurd and contradictory assertions."* Bruno's works, though in general considered those of a visionary and madman, were in very extensive circulation, probably not the less eagerly sought after from being included among the books prohibited by the Romish church; and although it has been reserved for later observations to furnish complete verification of his most daring speculations, yet there was enough, abstractedly taken, in the wild freedom of his remarks, to attract a mind like Galileo's; and it is with more satisfaction that we refer the formation of his opinions to a man of undoubted though eccentric genius, like Bruno, than to such as Maestlin, who, though a diligent and careful observer, seems seldom to have taken any very enlarged views of the science on which he was engaged.

With a few exceptions similar to those above mentioned, the rest of Galileo's contemporaries well deserved the contemptuous epithet which he fixed on them of Paper Philosophers, for, to use his own words, in a letter to Kepler on this subject, "this sort of men fancied philosophy was to be studied like the Æneid or Odyssey, and that the true reading of nature was to be detected by the collation of texts." Galileo's own method of philosophizing was widely different; seldom omitting to bring with every new assertion the test of experiment, either directly in confirmation of it, or tending to show its probability and consistency. We have already seen that he engaged in a series of experiments to investigate the truth of some of Aristotle's positions. As fast as he succeeded in demonstrating the falsehood of any of them, he denounced them from his professorial chair with an energy and success which irritated more and more against him the other members of the academic body.

There seems something in the stubborn opposition which he encountered in establishing the truth of his mechanical theorems, still more stupidly absurd than in the ill will to which, at a later period of his life, his astronomical opinions exposed him: it is intelligible that the vulgar should withhold their assent from one who pretended to discoveries in the remote heavens, which few possessed instruments to verify, or talents to appreciate; but it is difficult to find terms for stigmatizing the obdurate folly of those who preferred the evidence of their books to that of their senses, in judging of phenomena so obvious as those, for instance, presented by the fall of bodies to the ground. Aristotle had asserted, that if two different weights of the same material were let fall from the same height, the heavier one would reach the ground sooner than the other, in the proportion of their weights. The experiment is certainly not a very difficult one, but nobody thought of that method of argument, and consequently this assertion had been long received, upon his word, among the axioms of the science of motion. Galileo ventured to appeal from the authority of Aristotle to that of his own senses, and maintained that, with the exception of an inconsiderable difference, which he attributed to the disproportionate resistance of the air, they would fall in the same time. The Aristotelians ridiculed and refused to listen to such an idea. Galileo repeated his experiments in their presence from the famous leaning tower at Pisa: and with the sound of the simultaneously falling weights still ringing in their ears, they could persist in gravely maintaining that a weight of ten pounds would reach the ground in a tenth part of the time taken by one of a single pound, because they were able to quote chapter and verse in which Aristotle assures them that such is the fact. A temper of mind like this could not fail to produce ill will towards him who felt no scruples in exposing their wilful folly; and the watchful malice of these men soon found the means of making Galileo desirous of quitting his situation at Pisa. Don Giovanni de' Medici, a natural son of Cosmo, who possessed a slight knowledge of mechanics on which he prided himself, had proposed a contrivance for cleansing the port of Leghorn, on the efficiency of which Galileo was consulted. His opinion was unfavourable, and the violence of the inventor's disappointment, (for Galileo's judgment was verified by the result,) took the somewhat unreasonable direction of hatred towards the man whose penetration had foreseen the failure. Galileo's situation was rendered so unpleasant by the machinations of this person, that he decided on accepting overtures elsewhere, which had already been made to him; accordingly, under the negotiation of his staunch friend Guido Ubaldi, and with the consent of Ferdinand, he procured from the republic of Venice a nomination for six years to the professorship of mathematics in the university of Padua, whither he removed in September 1592.

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* De l'Infinito Universo. Dial. 3. La Cena de le Cenere, 1584.

Galileo's predecessor in the mathematical chair at Padua was Moleti, who died in 1588, and the situation had remained unfilled during the intervening four years. This seems to show that the directors attributed but little importance to the knowledge which it was the professor's duty to impart. This inference is strengthened by the fact, that the amount of the annual salary attached to it did not exceed 180 florins, whilst the professors of philosophy and civil law, in the same university, were rated at the annual stipends of 1400 and 1680 florins.* Galileo joined the university about a year after its triumph over the Jesuits, who had established a school in Padua about the year 1542, and, increasing yearly in influence, had shown symptoms of a design to get the whole management of the public education into the hands of their own body.† After several violent disputes it was at length decreed by the Venetian senate, in 1591, that no Jesuit should be allowed to give instruction at Padua in any of the sciences professed in the university. It does not appear that after this decree they were again troublesome to the university, but this first decree against them was followed, in 1606, by a second more peremptory, which banished them entirely from the Venetian territory. Galileo would of course find his fellow-professors much embittered against that society, and would naturally feel inclined to make common cause with them, so that it is not unlikely that the hatred which the Jesuits afterwards bore to Galileo on personal considerations, might be enforced by their recollection of the university to which he had belonged.

Galileo's writings now began to follow each other with great rapidity, but he was at this time apparently so careless of his reputation, that many of his works and inventions, after a long circulation in manuscript among his pupils and friends, found their way into the hands of those who were not ashamed to publish them as their own, and to denounce Galileo's claim to the authorship as the pretence of an impudent plagiarist. He was, however, so much beloved and esteemed by his friends, that they vied with each other in resenting affronts of this nature offered to him, and in more than one instance he was relieved, by their full and triumphant answers, from the trouble of vindicating his own character.

To this epoch of Galileo's life may be referred his re-invention of the thermometer. The original idea of this useful instrument belongs to the Greek mathematician Hero; and Santorio himself, who has been named as the inventor by Italian writers, and at one time claimed it himself, refers it to him. In 1638, Castelli wrote to Cesarini that "he remembered an experiment shown to him more than thirty-five years back by Galileo, who took a small glass bottle, about the size of a hen's egg, the neck of which was twenty-two inches long, and as narrow as a straw. Having well heated the bulb in his hands, and then introducing its mouth into a vessel in which was a little water, and withdrawing the heat of his hand from the bulb, the water rose in the neck of the bottle more than eleven inches above the level in the vessel, and Galileo employed this principle in the construction of an instrument for measuring heat and cold."* In 1613, a Venetian nobleman named Sagredo, who has been already mentioned as Galileo's friend and pupil, writes to him in the following words: "I have brought the instrument which you invented for measuring heat into several convenient and perfect forms, so that the difference of temperature between two rooms is seen as far as 100 degrees."* This date is anterior to the claims both of Santorio and Drebbel, a Dutch physician, who was the first to introduce it into Holland.

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* Riccoboni, Commentarii de Gymnasio Patavino, 1598.

† Nelli.

* Nelli.

Galileo's thermometer, as we have just seen, consisted merely of a glass tube ending in a bulb, the air in which, being partly expelled by heat, was replaced by water from a glass into which the open end of the tube was plunged, and the different degrees of temperature were indicated by the expansion of the air which yet remained in the bulb, so that the scale would be the reverse of that of the thermometer now in use, for the water would stand at the highest level in the coldest weather. It was, in truth, a barometer also, in consequence of the communication between the tube and external air, although Galileo did not intend it for this purpose, and when he attempted to determine the relative weight of the air, employed a contrivance still more imperfect than this rude barometer would have been. A passage among his posthumous fragments intimates that he subsequently used spirit of wine instead of water.

Viviani attributes an improvement of this imperfect instrument, but without specifying its nature, to Ferdinand II., a pupil and subsequent patron of Galileo, and, after the death of his father Cosmo, reigning duke of Florence. It was still further improved by Ferdinand's younger brother, Leopold de' Medici, who invented the modern process of expelling all the air from the tube by boiling the spirit of wine in it, and of hermetically sealing the end of the tube, whilst the contained liquid is in this expanded state, which deprived it of its barometrical character, and first made it an accurate thermometer. The final improvement was the employment of mercury instead of spirit of wine, which is recommended by Lana so early as 1670, on account of its equable expansion.† For further details on the history and use of this instrument, the reader may consult the Treatises on the THERMOMETER and PYROMETER.

CHAPTER IV.

Astronomy before Copernicus—Fracastoro — Bacon — Kepler — Galileo's Treatise on the Sphere.

THIS period of Galileo's lectureship at Padua derives interest from its including the first notice which we find of his having embraced the doctrines of the Copernican astronomy. Most of our readers are aware of the principles of the theory of the celestial motions which Copernicus restored; but the number of those who possess much knowledge of the cumbrous and unwieldy system which it superseded is perhaps more limited. The present is not a fit opportunity to enter into many details respecting it; these will find their proper place in the History of Astronomy: but a brief sketch of its leading principles is necessary to render what follows intelligible.

The earth was supposed to be immoveably fixed in the centre of the universe, and immediately surrounding it the atmospheres of air and fire, beyond which the sun, moon, and planets, were thought to be carried round the earth, fixed each to a separate orb or heaven of solid but transparent matter. The order of distance in which they were supposed to be placed with regard to the central earth was as follows: The Moon, Mercury, Venus, The Sun, Mars, Jupiter, and Saturn. It became a question in the ages immediately preceding Copernicus, whether the Sun was not nearer the Earth than Mercury, or at least than Venus; and this question was one on which the astronomical theorists were then chiefly divided.

We possess at this time a curious record of a former belief in this arrangement of the Sun and planets, in the order in which the days of the week have been named from them. According to the dreams of Astrology, each planet was supposed to exert its influence in succession, reckoning from the most distant down to the nearest, over each hour of the twenty-four. The planet which was supposed to predominate over the first hour, gave its name to that day.* The general reader will trace this curious fact more easily with the French or Latin names than with the English, which have been translated into the titles of the corresponding Saxon deities. Placing the Sun and planets in the following order, and beginning, for instance, with Monday, or the Moon's day; Saturn ruled the second hour of that day, Jupiter the third, and so round till we come again and again to the Moon on the 8th, 15th, and 22d hours; Saturn ruled the 23d,

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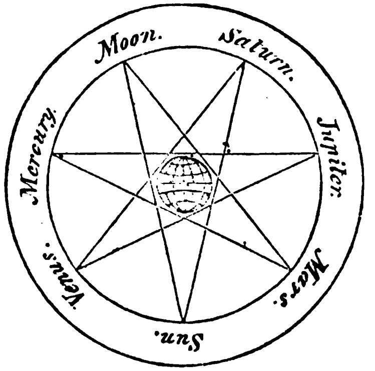
* Venturi. Memorie e Lettere di Gal. Galilei. Modena, 1821.

† Prodromo all' Arte Maestra. Brescia, 1670.

* Dion Cassius, lib. 37.

Jupiter the 24th, so that the next day would be the day of Mars, or, as the Saxons translated it, Tuisco's day, or Tuesday. In the same manner the following days would belong respectively to Mercury or Woden, Jupiter or Thor, Venus or Frea, Saturn or Seater, the Sun, and again the Moon. In this manner the whole week will be found to complete the cycle of the seven planets.



The other stars were supposed to be fixed in an outer orb, beyond which were two crystalline spheres, (as they were called,) and on the outside of all, the *primum mobile* or *first moveable*, which sphere was supposed to revolve round the earth in twenty-four hours, and by its friction, or rather, as most of the philosophers of that day chose to term it, by the sort of heavenly influence which it exercised on the interior orbs, to carry them round with a similar motion. Hence the diversity of day and night. But beside this principal and general motion, each orb was supposed to have one of its own, which was intended to account for the apparent changes of position of the planets with respect to the fixed stars and to each other. This supposition, however, proving insufficient to account for all the irregularities of motion observed, two hypotheses were introduced.—First, that to each planet belonged several concentric spheres or heavens, casing each other like the coats of an onion, and, secondly, that the centres of these solid spheres, with which the planet revolved, were placed in the circumference of a secondary revolving sphere, the centre of which secondary sphere was situated at the earth. They thus acquired the names of Eccentrics or Epicycles, the latter word signifying a circle upon a circle. The whole art of astronomers was then directed towards inventing and combining different eccentric and epicyclical motions, so as to represent with tolerable fidelity the ever varying phenomena of the heavens. Aristotle had lent his powerful assistance in this, as in other branches of natural philosophy, in enabling the false system to prevail against and obliterate the knowledge of the true, which, as we gather from his own writings, was maintained by some philosophers before his time. Of these ancient opinions, only a few traces now remain, principally preserved in the works of those who were adverse to them. Archimedes says expressly that Aristarchus of Samos, who lived about 300 B. C., taught the immobility of the sun and stars, and that the earth is carried round the central sun.[*] Aristotle's words are: "Most of those who assert that the whole concave is finite, say that the earth is situated in the middle point of the universe: those who are called Pythagoreans, who live in Italy, are of a contrary opinion. For they say that fire is in the centre, and that the earth, which, according to them, is one of the stars, occasions the change of day and night by its own motion, with which it is carried about the centre." It might be doubtful, upon this passage alone, whether the Pythagorean theory embraced more than the diurnal motion of the earth, but a little farther, we find the following passage: "Some, as we have said, make the earth to be one of the stars: others say that it is placed in the centre of the Universe, and revolves on a central axis."[†] From which, in conjunction with the former extract, it very plainly appears that the Pythagoreans maintained both the diurnal and annual motions of the earth.

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[*] The pretended translation by Roberval of an Arabic version of Aristarchus, "De Systemate Mundi," in which the Copernican system is fully developed, is spurious. Menage asserts this in his observations on Diogen. Laert. lib. 8, sec. 85, tom. ii., p. 389. (Ed. Amst. 1692.) The commentary contains many authorities well worth consulting. Delambre, Histoire de l'Astronomie, infers it from its not containing some opinions which Archimedes tells us were held by Aristarchus. A more direct proof may be gathered from the following blunder of the supposed translator. Astronomers had been long aware that the earth in different parts of her orbit is at different distances from the sun. Roberval wished to claim for Aristarchus the credit of having known this, and introduced into his book, not only the mention of the fact, but an explanation of its cause. Accordingly he makes Aristarchus give a reason "why the sun's apogee (or place of greatest distance from the earth) must always be at the north summer solstice." In fact, it was there, or nearly so, in Roberval's time, and he knew not but that it had always been there. It is however moveable, and, when Aristarchus lived, was nearly half way between the solstices and equinoxes. He therefore would hardly have given a reason for the necessity of a phenomenon of which, if he observed anything on the subject, he must have observed the contrary. The change in the obliquity of the earth's axis to the ecliptic was known in the time of Roberval, and he accordingly has introduced the proper value which it had in Aristarchus's time.

[†] De Cœlo. lib. 2.

Some idea of the supererogatory labour entailed upon astronomers by the adoption of the system which places the earth in the centre, may be formed in a popular manner by observing, in passing through a thickly planted wood, in how complicated a manner the relative positions of the trees appear at each step to be continually changing, and by considering the difficulty with which the laws of their apparent motions could be traced, if we were to attempt to refer these changes to a real motion of the trees instead of the traveller. The apparent complexity in the heavens is still greater than in the case suggested; because, in addition to the earth's motions, with which all the stars appear to be impressed, each of the planets has also a real motion of its own, which of course greatly contributes to perplex and complicate the general appearances. Accordingly the heavens rapidly became, under this system,

> "With centric and eccentric scribbled o'er,
> Cycle and epicycle, orb in orb;"[*]

crossing and penetrating each other in every direction. Maestlin has given a concise enumeration of the principal orbs which belonged to this theory. After warning the readers that "they are not mere fictions which have nothing to correspond with them out of the imagination, but that they exist really and bodily in the heavens,"[†] he describes seven principal spheres belonging to each planet, which he classes as Eccentrics, Epicycles, and Concentrepicycles, and explains their use in accounting for the planet's revolutions, motions of the apogee, and nodes, &c. &c. In what manner this multitude of solid and crystalline orbs were secured from injuring or interfering with each other was not very closely inquired into.

The reader will cease to expect any very intelligible explanation of this and numberless other difficulties which belong to this unwieldy machinery when he is introduced to the reasoning by which it was upheld. Gerolamo Fracastoro, who lived in the sixteenth century, writes in the following terms, in his work entitled Homocentrica, (certainly one of the best productions of the day,) in which he endeavours to simplify the necessary apparatus, and to explain all the phenomena (as the title of his book implies) by concentric spheres round the earth. "There are some, not only of the ancients but also among the moderns, who believe that the stars move freely without any such agency; but it is difficult to conceive in what manner they have imbued themselves with this notion, *since not only reason, but the very senses, inform us that all the stars are carried round fastened to solid spheres.*" What ideas Fracastoro entertained of the evidence of the "senses" it is not now easy to guess, but he goes on to give a specimen of the "reasoning" which appeared to him so incontrovertible. "The planets are observed to move one while forwards, then backwards, now to the right, now to the left, quicker and slower by turns; which variety is consistent with a compound structure like that of an animal, which possesses in itself various springs and principles of action, but is totally at variance with our notion of a simple and undecaying substance like the heavens and heavenly bodies. For that which is simple, is altogether single, and singleness is of one only nature, and one nature can be the cause of only one effect; and therefore it is altogether impossible that the stars of themselves should move with such variety of motion. And besides, if the stars move by themselves, they either move in an empty space, or in a fluid medium like the air. But there cannot be such a thing as empty space, and if there were such a medium, the motion of the star would occasion condensation and rarefaction in different parts of it, which is the property of corruptible bodies and where they exist some violent motion is going on; but the heavens are incorruptible and are not susceptible of violent motion, and hence, and from many other similar reasons, any one who is not obstinate may satisfy himself that the stars cannot have any independent motion."

Some persons may perhaps think that arguments of this force are unnecessarily dragged from the obscurity to which they are now for the most part happily consigned; but it is essential, in order to set Galileo's character and merits in their true light, to show how low at this time philosophy had fallen. For we shall form a very inadequate notion of his powers and deserts if we do not contemplate him in the midst of men who, though of undoubted talent and ingenuity, could so far bewilder themselves as to mistake such a string of unmeaning phrases for argument: we must reflect on the difficulty every one experiences in delivering himself from the erroneous impressions of infancy, which will remain stamped upon the imagination in spite of all the efforts of matured reason to erase them, and consider every step of Galileo's course as a triumph over difficulties of a like nature. We ought to be fully penetrated with this feeling before we sit down to the perusal of his works, every line of which will then increase our admiration of the penetrating acuteness of his invention and unswerving accuracy of his judgment. In almost every page we discover an allusion to some new experiment, or the germ of some new theory; and amid all this wonderful fertility it is rarely indeed that we find the exuberance of his imagination seducing him from the rigid path of philosophical induction. This is the more remarkable as he was surrounded by friends and contemporaries of a different temperament and much less cautious disposition. A disadvantageous contrast is occasionally furnished even by the sagacious Bacon, who could so far deviate from the sound principles of inductive philosophy, as to write, for instance, in the following strain, bordering upon the worst manner of the Aristotelians:—"Motion in a circle has no limit, and seems to emanate from the appetite of the body, which moves only for the sake of moving, and that it may follow itself and seek its own embraces, and put in action and enjoy its own nature, and exercise its peculiar operation: on the contrary, motion in a straight line seems transitory, and to move towards a limit of cessation or rest, and that it may reach some point, and then put off its motion."* Bacon rejected all the machinery of the *primum mobile* and the solid spheres, the eccentrics and the epicycles, and carried his dislike of these doctrines so far as to assert that nothing short of their gross absurdity could have driven theorists to the extravagant supposition of the motion of the earth, which, said he, "we know to be most false."* Instances of extravagant suppositions and premature generalizations are to be found in almost every page of his other great contemporary, Kepler.

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[*] Paradise Lost, b. viii. v. 83.

[†] Itaque tam circulos primi motus quam orbes secundorum mobilium revera in cœlesti corpore esse concludimus, &c. Non ergo sunt mera figmenta, quibus extra mentem nihil correspondeat. M. Maestlini, De Astronomiæ Hypothesibus disputatio. Heidelbergæ, 1582.

It is with pain that we observe Delambre taking every opportunity, in his admirable History of Astronomy, to undervalue and sneer at Galileo, seemingly for the sake of elevating the character of Kepler, who appears his principal favourite, but whose merit as a philosopher cannot safely be brought into competition with that of his illustrious contemporary. Delambre is especially dissatisfied with Galileo, for taking no notice, in his "System of the World," of the celebrated laws of the planetary motions which Kepler discovered, and which are now inseparably connected with his name. The analysis of Newton and his successors has now identified those apparently mysterious laws with the general phenomena of motion, and has thus entitled them to an attention of which, before that time, they were scarcely worthy; at any rate not more than is at present the empirical law which includes the distances of all the planets from the sun (roughly taken) in one algebraical formula. The observations of Kepler's day were scarcely accurate enough to prove that the relations which he discovered between the distances of the planets from the sun and the periods of their revolutions around him were necessarily to be received as demonstrated truths; and Galileo surely acted most prudently and philosophically in holding himself altogether aloof from Kepler's fanciful devices and numeral concinnities, although, with all the extravagance, they possessed much of the genius of the Platonic reveries, and although it did happen that Galileo, by systematically avoiding them, failed to recognise some important truths. Galileo probably was thinking of those very laws, when he said of Kepler, "He possesses a bold and free genius, perhaps too much so; but his mode of philosophizing is widely different from mine." We shall have further occasion in the sequel to recognise the justice of this remark.

In the treatise on the Sphere which bears Galileo's name, and which, if he be indeed the author of it, was composed during the early part of his residence at

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* Opuscula Philosophica, Thema Cœli.

* "Nobis constat falsissimum esse." De Aug. Scient. lib. iii. c. 3. 1623.

Padua, he also adopts the Ptolemaic system, placing the earth immoveable in the centre, and adducing against its motion the usual arguments, which in his subsequent writings he ridicules and refutes. Some doubts have been expressed of its authenticity; but, however this may be, we have it under Galileo's own hand that he taught the Ptolemaic system, in compliance with popular prejudices, for some time after he had privately become a convert to the contrary opinions. In a letter, apparently the first which he wrote to Kepler, dated from Padua, 1597, he says, acknowledging the receipt of Kepler's Mysterium Cosmographicum, "I have as yet read nothing beyond the preface of your book, from which however I catch a glimpse of your meaning, and feel great joy on meeting with so powerful an associate in the pursuit of truth, and consequently such a friend to truth itself, for it is deplorable that there should be so few who care about truth, and who do not persist in their perverse mode of philosophizing; but as this is not the fit time for lamenting the melancholy condition of our times, but for congratulating you on your elegant discoveries in confirmation of the truth, I shall only add a promise to peruse your book dispassionately, and with a conviction that I shall find in it much to admire. *This I shall do the more willingly because many years ago I became a convert to the opinions of Copernicus,** and by that theory have succeeded in fully explaining many phenomena, which on the contrary hypothesis are altogether inexplicable. I have arranged many arguments and confutations of the opposite opinions, *which however I have not yet dared to publish,* fearing the fate of our master Copernicus, who, although he has earned immortal fame among a few, yet by an infinite number (for so only can the number of fools be measured) is exploded and derided. If there were many such as you, I would venture to publish my speculations; but, since that is not so, I shall take time to consider of it." This interesting letter was the beginning of the friendship of these two great men, which lasted uninterruptedly till 1632, the date of Kepler's death. That extraordinary genius never omitted an opportunity of testifying his admiration of Galileo, although there were not wanting persons envious of their good understanding, who exerted themselves to provoke coolness and quarrel between them. Thus Brutius writes to Kepler in 1602*: "Galileo tells me he has written to you, and has got your book, which however he denied to Magini, and I abused him for praising you with too many qualifications. I know it to be a fact that, both in his lectures, and elsewhere, he is publishing your inventions as his own; but I have taken care, and shall continue to do so, that all this shall redound not to his credit but to yours." The only notice which Kepler took of these repeated insinuations, which appear to have been utterly groundless, was, by renewed expressions of respect and admiration, to testify the value he set upon his friend and fellow-labourer in philosophy.

CHAPTER V.

Galileo re-elected Professor at Padua —New star—Compass of proportion—Capra—Gilbert—Proposals to return to Pisa—Lost writings—Cavalieri.

GALILEO'S reputation was now rapidly increasing: his lectures were attended by many persons of the highest rank; among whom were the Archduke Ferdinand, afterwards Emperor of Germany, the Landgrave of Hesse, and the Princes of Alsace and Mantua. On the expiration of the first period for which he had been elected professor, he was rechosen for a similar period, with a salary increased to 320 florins. The immediate occasion of this augmentation is said by Fabroni†, to have arisen out of the malice of an ill wisher of Galileo, who, hoping to do him disservice, apprized the senate that he was not married to Marina Gamba, then living with him, and the mother of his son Vincenzo. Whether or not the senate might consider themselves entitled to inquire into the morality of his private life, it was probably from a wish to mark their sense of the informer's impertinence, that they returned the brief answer, that "if he had a family to provide for, he stood the more in need of an increased stipend."

During Galileo's residence at Padua, and, according to Viviani's intimation, towards the thirtieth year of his age, that is to say in 1594, he experienced the first attack of a disease which pressed heavily on him for the rest of his life. He enjoyed, when a young man, a healthy and vigorous constitution, but chancing to sleep one afternoon near an open window, through which was blowing a current of air cooled artificially by the fall of water, the consequences were most disastrous to him. He contracted a sort of chronic complaint, which showed itself in acute pains in his limbs, chest, and back, accompanied with frequent hæmorrhages and loss of sleep and appetite; and this painful disorder thenceforward never left him entirely, but recurred intermittingly, with greater or less violence, as long as he lived. Others of the party did not even escape so well, but died shortly after committing this imprudence.

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* Id autum eò libentius faciam, quod in Copernici sententiam multis abhinc annis venerim.—Kepl. Epistolæ.

* Kepleri Epistolæ.

† Vitæ Italorum Illustrium.

In 1604, the attention of astronomers was called to the contemplation of a new star, which appeared suddenly with great splendour in the constellation Serpentarius, or Ophiuchus, as it is now more commonly called. Maestlin, who was one of the earliest to notice it, relates his observations in the following words: "How wonderful is this new star! I am certain that I did not see it before the 29th of September, nor indeed, on account of several cloudy nights, had I a good view till the 6th of October. Now that it is on the other side of the sun, instead of surpassing Jupiter as it did, and almost rivalling Venus, it scarcely matches the Cor Leonis, and hardly surpasses Saturn. It continues however to shine with the same bright and strongly sparkling light, and changes its colours almost with every moment; first tawny, then yellow, presently purple and red, and, when it has risen above the vapours, most frequently white." This was by no means an unprecedented phenomenon; and the curious reader may find in Riccioli* a catalogue of the principal new stars which have at different times appeared. There is a tradition of a similar occurrence as early as the times of the Greek astronomer Hipparchus, who is said to have been stimulated by it to the formation of his catalogue of the stars; and only thirty-two years before, in 1572, the same remarkable phenomenon in the constellation Cassiopeia was mainly instrumental in detaching the celebrated Tycho Brahe from the chemical studies, which till then divided his attention with astronomy. Tycho's star disappeared at the end of two years; and at that time Galileo was a child. On the present occasion, he set himself earnestly to consider the new phenomenon, and embodied the results of his observations in three lectures, which have been unfortunately lost. Only the exordium of the first has been preserved: in this he reproaches his auditors with their general insensibility to the magnificent wonders of creation daily exposed to their view, in no respect less admirable than the new prodigy, to hear an explanation of which they had hurried in crowds to his lecture room. He showed, from the absence of parallax, that the new star could not be, as the vulgar hypothesis represented, a mere meteor engendered in our atmosphere and nearer the earth than the moon, but must be situated among the most remote heavenly bodies. This was inconceivable to the Aristotelians, whose notions of a perfect, simple, and unchangeable sky were quite at variance with the introduction of any such new body; and we may perhaps consider these lectures as the first public declaration of Galileo's hostility to the old Ptolemaic and Aristotelian astronomy.

In 1606 he was reappointed to the lectureship, and his salary a second time increased, being raised to 520 florins. His public lectures were at this period so much thronged that the ordinary place of meeting was found insufficient to contain his auditors, and he was on several occasions obliged to adjourn to the open air,—even from the school of medicine, which was calculated to contain one thousand persons.

About this time he was considerably annoyed by a young Milanese, of the name of Balthasar Capra, who pirated an instrument which Galileo had invented some years before, and had called the geometrical and military compass. The original offender was a German named Simon Mayer, whom we shall meet with afterwards arrogating to himself the merit of one of Galileo's astronomical discoveries; but on this occasion, as soon as he found Galileo disposed to resent the injury done to him, he hastily quitted Italy, leaving his friend Capra to bear alone the shame of the exposure which followed. The instrument is of simple construction, consisting merely of two straight rulers, connected by a joint; so that they can be set to any required angle. This simple and useful instrument, now called the Sector, is to be found in almost every case of mathematical instruments. Instead of the trigonometrical and logarithmic lines which are now generally engraved upon it, Galileo's compass merely contained, on one side, three pairs of lines, divided in simple, duplicate, and triplicate proportion, with a fourth pair on which were registered the specific gravities of several of the most common metals. These were used for multiplications, divisions, and the extraction of roots; for finding the dimensions of equally heavy balls of different materials, &c. On the other side were lines contrived for assisting to describe any required polygon on a given line; for finding polygons of one kind equal in area to those of another; and a multitude of other similar operations useful to the practical engineer.

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* Almagestum Novum, vol. i.

Unless the instrument, which is now called Gunter's scale, be much altered from what it originally was, it is difficult to understand on what grounds Salusbury charges Gunter with plagiarism from Galileo's Compass. He declares that he has closely compared the two, and can find no difference between them.* There has also been some confusion, by several writers, between this instrument and what is now commonly called the Proportional Compass. The latter consists of two slips of metal, pointed at each end, and connected by a pin which, sliding in a groove through both, can be shifted to different positions. Its use is to find proportional lines; for it is obvious that the openings measured by each pair of legs will be in the same proportion in which the slips are divided by the centre. The divisions usually marked on it are calculated for finding the submultiples of straight lines, and the chords of submultiple arcs. Montucla has mentioned this mistake of one instrument for the other, and charges Voltaire with the more inexcusable error of confounding Galileo's with the Mariner's Compass. He refers to a treatise by Hulsius for his authority in attributing the Proportional Compass to Burgi, a Swiss astronomer of some celebrity. Horcher also has been styled the inventor; but he did no more than describe its form and application. In the frontispiece of his book is an engraving of this compass exactly similar to those which are now used.† To the description which Galileo published of his compass, he added a short treatise on the method of measuring heights and distances with the quadrant and plumb line. The treatise, which is printed by itself at the end of the first volume of the Padua edition of Galileo's works, contains nothing more than the demonstrations belonging to the same operations. They are quite elementary, and contain little or nothing that was new even at that time.

Such an instrument as Galileo's Compass was of much more importance before the grand discovery of logarithms than it can now be considered: however it acquires an additional interest from the value which he himself set on it. In 1607, Capra, at the instigation of Mayer, published as his own invention what he calls the proportional hoop, which is a mere copy of Galileo's instrument. This produced from Galileo a long essay, entitled "A Defence of Galileo against the Calumnies and Impostures of Balthasar Capra." His principal complaint seems to have been of the misrepresentations which Capra had published of his lectures on the new star already mentioned, but he takes occasion, after pointing out the blunders and falsehoods which Capra had committed on that occasion, to add a complete proof of his piracy of the geometrical compass. He showed, from the authenticated depositions of workmen, and of those for whom the instruments had been fabricated, that he had devised them as early as the year 1597, and had explained their construction and use both to Balthasar himself and to his father Aurelio Capra, who was then residing in Padua. He gives, in the same essay, the minutes of a public meeting between himself and Capra, in which he proved, to the satisfaction of the university, that wherever Capra had endeavoured to introduce into his book propositions which were not to be met with in Galileo's, he had fallen into the greatest absurdities, and betrayed the most complete ignorance of his subject. The consequence of this public exposure, and of the report of the famous Fra Paolo Sarpi, to whom the matter had been referred, was a formal prohibition by the university of Capra's publication, and all copies of the book then on hand were seized, and probably destroyed, though Galileo has preserved it from oblivion by incorporating it in his own publication.

Nearly at the same time, 1607, or immediately after, he first turned his attention towards the loadstone, on which our countryman Gilbert had already published his researches, conducted in the true spirit of the inductive method. Very little that is original is to be found in Galileo's works on this subject, except some allusions to his method of arming magnets, in which, as in most of his practical and mechanical operations, he appears to have been singularly successful. Sir Kenelm Digby* asserts, that the magnets armed by Galileo would support twice as great a weight as one of Gilbert's of the same size. Galileo was well acquainted, as appears from his frequent allusions in different parts of his works, with what Gilbert had done, of whom he says, "I extremely praise, admire, and envy this author;—I think him, moreover, worthy of the greatest praise for the many new and true observations that he has made to the disgrace of so many vain and fabling authors, who write, not from their own knowledge only, but repeat every thing they hear from the foolish vulgar, without attempting to satisfy themselves of the same by experience, perhaps that they may not diminish the size of their books."

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* Math. Coll. vol. ii.

† Constructio Circini Proportionum. Moguntiæ, 1605.

Galileo's reputation being now greatly increased, proposals were made to him, in 1609, to return to his original situation at Pisa. He had been in the habit of passing over to Florence during the academic vacation, for the purpose of giving mathematical instruction to the younger members of Ferdinand's family; and Cosmo, who had now succeeded his father as duke of Tuscany, regretted that so masterly a genius had been allowed to leave the university which he naturally should have graced. A few extracts from Galileo's answers to these overtures will serve to show the nature of his situation at Padua, and the manner in which his time was there occupied. "I will not hesitate to say, having now laboured during twenty years, and those the best of my life, in dealing out, as one may say, in detail, at the request of any body, the little talent which God has granted to my assiduity in my profession, that my wish certainly would be to have sufficient rest and leisure to enable me, before my life comes to its close, to conclude three great works which I have in hand, and to publish them; which might perhaps bring some credit to me, and to those who had favoured me in this undertaking, and possibly may be of greater and more frequent service to students than in the rest of my life I could personally afford them. Greater leisure than I have here I doubt if I could meet with elsewhere, so long as I am compelled to support my family from my public and private lectures, (nor would I willingly lecture in any other city than this, for several reasons which would be long to mention) nevertheless not even the liberty I have here is sufficient, where I am obliged to spend many, and often the best hours of the day at the request of this and that man.—My public salary here is 520 florins, which I am almost certain will be advanced to as many crowns upon my re-election, and these I can greatly increase by receiving pupils, and from private lectures, to any extent that I please. My public duty does not confine me during more than 60 half hours in the year, and even that not so strictly but that I may, on occasion of any business, contrive to get some vacant days; the rest of my time is absolutely at my own disposal; but because my private lectures and domestic pupils are a great hindrance and interruption of my studies, I wish to live entirely exempt from the former, and in great measure from the latter: for if I am to return to my native country, I should wish the first object of his Serene Highness to be, that leisure and opportunity should be given me to complete my works without employing myself in lecturing.—And, in short, I should wish to gain my bread from my writings, which I would always dedicate to my Serene Master.—The works which I have to finish are principally—two books on the system or structure of the Universe, an immense work, full of philosophy, astronomy, and geometry; three books on Local Motion, a science entirely new, no one, either ancient or modern, having discovered any of the very many admirable accidents which I demonstrate in natural and violent motions, so that I may with very great reason call it a new science, and invented by me from its very first principles; three books of Mechanics, two on the demonstration of principles and one of problems; and although others have treated this same matter, yet all that has been hitherto written, neither in quantity, nor otherwise, is the quarter of what I am writing on it. I have also different treatises on natural subjects; On sound and speech; On light and colours; On the tide; On the composition of continuous quantity; On the motions of animals;—And others besides. I have also an idea of writing some books relating to the military art, giving not only a model of a soldier, but teaching with very exact rules every thing which it is his duty to know that depends upon mathematics; as the knowledge of castrametation, drawing up battalions, fortifications, assaults, planning, surveying, the knowledge of artillery, the use of instruments, &c. I also wish to reprint the 'Use of my Geometrical Compass,' which is dedicated to his highness, and which is no longer to be met with; for this instrument has experienced such favour from the public, that in fact no other instruments of this kind are now made, and I know that up to this time several thousands of mine have been made.—I say nothing as to the amount of my salary, feeling convinced that as I am to live upon it, the graciousness of his highness would not deprive me of any of those comforts, which, however, I feel the want of less than many others; and therefore I say nothing more on the subject. Finally, on the title and profession of my service, I should wish that to the name of Mathematician, his highness would add that of Philosopher, as I profess to have studied a greater number of years in philosophy than months in pure mathematics; and how I have profited by it, and if I can or ought to deserve this title, I may let their highnesses see as often as it shall please them to give me an opportunity of discussing such subjects in their presence with those who are most esteemed in this knowledge." It may perhaps be seen in the expressions of this letter, that Galileo was not inclined to undervalue his own merits, but the peculiar nature of the correspondence should be taken into account, which might justify his indulging a little more than usual in self-praise, and it would have been perhaps almost impossible for him to have remained entirely blind to his vast superiority over his contemporaries.

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* Treatise of the Nature of Bodies. London, 1665.

Many of the treatises which Galileo here mentions, as well as another on dialling, have been irrecoverably lost, through the superstitious weakness of some of his relations, who after his death suffered the family confessor to examine his papers, and to destroy whatever seemed to him objectionable; a portion which, according to the notions then prevalent, was like to comprise the most valuable part of the papers submitted to this expurgation. It is also supposed that many were burnt by his infatuated grandson Cosimo, who conceived he was thus offering a proper and pious sacrifice before devoting himself to the life of a missionary. A Treatise on Fortification, by Galileo, was found in 1793, and is contained among the documents published by Venturi. Galileo does not profess in it to give much original matter, but to lay before his readers a compendium of the most approved principles then already known. It has been supposed that Gustavus Adolphus of Sweden attended Galileo's lectures on this subject, whilst in Italy; but the fact is not satisfactorily ascertained. Galileo himself mentions a Prince Gustavus of Sweden to whom he gave instruction in mathematics, but the dates cannot well be made to agree. The question deserves notice only from its having been made the subject of controversy.

The loss of Galileo's Essay on Continuous Quantity is particularly to be regretted, as it would be highly interesting to see how far he succeeded in methodizing his thoughts on this important topic. It is to his pupil Cavalieri (who refused to publish his book so long as he hoped to see Galileo's printed) that we owe "The Method of Indivisibles," which is universally recognized as one of the first germs of the powerful methods of modern analysis. Throughout Galileo's works we find many indications of his having thought much on the subject, but his remarks are vague, and bear little, if at all, on the application of the method. To this the chief part of Cavalieri's book is devoted, though he was not so entirely regardless of the principles on which his method of measuring spaces is founded, as he is sometimes represented. This method consisted in considering lines as made up of an infinite number of points, surfaces in like manner as composed of lines, and solids of surfaces; but there is an observation at the beginning of the 7th book, which shews clearly that Cavalieri had taken a much more profound view of the subject than is implied in this superficial exposition, and had approached very closely to the apparently more exact theories of his successors. Anticipating the objections to his hypothesis, he argues, that "there is no necessity to suppose the continuous quantities made up of these indivisible parts, *but only that they will observe the same ratios as those parts do*." It ought not to be omitted, that Kepler also had given an impulse to

Cavalieri in his "New method of Guaging," which is the earliest work with which we are acquainted, where principles of this sort are employed.[*]

Chapter VI.

Invention of the telescope—Fracastoro—Porta—Reflecting telescope—Roger Bacon—Digges—De Dominis—Jansen—Lipperhey—Galileo constructs telescopes—Microscopes—Re-elected Professor at Padua for life.

The year 1609 was signalized by Galileo's discovery of the telescope, which, in the minds of many, is the principal, if not the sole invention associated with his name. It cannot be denied that his fame, as the founder of the school of experimental philosophy, has been in an unmerited degree cast into the shade by the splendour of his astronomical discoveries; yet Lagrange[†] surely errs in the opposite extreme, when he almost denies that these form any real or solid part of the glory of this great man; and Montucla[‡] omits an important ingredient in his merit, when he (in other respects very justly) remarks, that it required far less genius to point a telescope towards the heavens than to trace the unheeded, because daily recurring, phenomena of motion up to its simple and primary laws. We are to remember that in the days of Galileo a telescope could scarcely be pointed to the heavens with impunity, and that a courageous mind was required to contradict, and a strong one to bear down, a party, who, when invited to look on any object in the heavens which Aristotle had never suspected, immediately refused all credit to those senses, to which, on other occasions, they so confidently appealed. It surely is a real and solid part of Galileo's glory that he consumed his life in laborious and indefatigable observations, and that he persevered in announcing his discoveries undisgusted by the invectives, and undismayed by the persecutions, to which they subjected him. Plagiarist! liar! impostor! heretic! were among the expressions of malignant hatred lavished upon him, and although he also was not without some violent and foul-mouthed partisans, yet it must be told to his credit that he himself seldom condescended to notice these torrents of abuse, otherwise than by good-humoured retorts, and by prosecuting his observations with renewed assiduity and zeal.

The use of single lenses in aid of the sight had been long known. Spectacles were in common use at the beginning of the fourteenth century, and there are several hints, more or less obscure, in many early writers, of the effects which might be expected from a combination of glasses; but it does not appear with certainty that any of these authors had attempted to reduce their ideas to practice. After the discovery of the telescope, almost every country endeavoured to find in the writings of its early philosophers traces of the knowledge of such an instrument, but in general with success very inadequate to the zeal of their national prepossessions. There are two authors especially to whom the attention of Kepler and others was turned, immediately upon the promulgation of the discovery, as containing the germ of it in their works. These are Baptista Porta, and Gerolamo Fracastoro. We have already had occasion to quote the Homocentrica of Fracastoro, who died in 1553; the following expressions, though they seem to refer to actual experiment, yet fall short of the meaning with which it has been attempted to invest them. After explaining and commenting on some phenomena of refraction through different media, to which he was led by the necessity of reconciling his theory with the variable magnitudes of the planets, he goes on to say—"For which reason, those things which are seen at the bottom of water, appear greater than those which are at the top; and if any one look through two eyeglasses, *one placed upon the other*, he will see every thing much larger and nearer."[*] It should seem that this passage (as Delambre has already remarked) rather refers to the close application of one glass upon another, and it may fairly be doubted whether any thing analogous to the composition of the telescope was in the writer's thoughts. Baptista Porta writes on the same subject more fully;—"Concave lenses show distant objects most clearly, convex those which are nearer, whence they may be used to assist the sight. With a concave glass distant objects will be seen, small, but distinct; with a convex one those near at hand, larger, but confused; *if you*

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[*] Nova Stereometria Doliorum—Lincii, 1615.

[†] Mecanique Analytique.

[‡] Histoire des Mathématiques, tom. ii.

[*] "Per duo specilla ocularia si quis perspiciat, altero alteri superposito, majora multo et propinquiora videbit omnia."—Fracast. Homocentrica, § 2, c. 8.

know rightly how to combine one of each sort, you will see both far and near objects larger and clearer."[*] These words show, if Porta really was then unacquainted with the telescope, how close it is possible to pass by an invention without lighting on it, for of precisely such a combination of a convex and concave lens, fitted to the ends of an organ pipe by way of tube, did the whole of Galileo's telescope consist. If Porta had stopped here he might more securely have enjoyed the reputation of the invention, but he then professes to describe the construction of his instrument, which has no relation whatever to his previous remarks. "I shall now endeavour to show in what manner we may contrive to recognize our friends at the distance of several miles, and how those of weak sight may read the most minute letters from a distance. It is an invention of great utility, and grounded on optical principles, nor is it at all difficult of execution; but it must be so divulged as not to be understood by the vulgar, and yet be clear to the sharpsighted." The description which follows seems far enough removed from the apprehended danger of being too clear, and indeed every writer who has hitherto quoted it has merely given the passage in its original Latin, apparently despairing of an intelligible translation. With some alterations in the punctuation, which appear necessary to bring it into any grammatical construction,[†] it may be supposed to bear something like the following meaning:—"Let a view be contrived in the centre of a mirror, where it is most effective. All the solar rays are exceedingly dispersed, and do not in the least come together (in the true centre); but there is a concourse of all the rays in the central part of the said mirror, half way towards the other centre, where the cross diameters meet. This view is contrived in the following manner. A concave cylindrical mirror placed directly in front, but with its axis inclined, must be adapted to that focus: and let obtuse angled or right angled triangles be cut out with two cross lines on each side drawn from the centre, and a glass (*specillum*) will be completed fit for the purposes we mentioned." If it were not for the word "*specillum*," which, in the passage immediately preceding this, Porta[*] contrasts with "*speculum*," and which he afterwards explains to mean a glass lens, it would be very clear that the foregoing passage (supposing it to have any meaning) must be referred to a reflecting telescope, and it is a little singular that while this obscure passage has attracted universal attention, no one, so far as we are aware, has taken any notice of the following unequivocal description of the principal part of Newton's construction of the same instrument. It is in the 5th chapter of the 17th book, where Porta explains by what device exceedingly minute letters may be read without difficulty. "Place a concave mirror so that the back of it may lie against your breast; opposite to it, and within the burning point, place the writing; put a plane mirror behind it, that may be under your eyes. Then the images of the letters which are in the concave mirror, and which the concave has magnified, will be reflected in the plane mirror, so that you may read without difficulty."

We have not been able to meet with the Italian translation of Porta's Natural Magic, which was published in 1611, under his own superintendence; but the English translator of 1658 would probably have known if any intelligible interpretation were there given of the mysterious passage above quoted, and his translation is so devoid of meaning as strongly to militate against this idea. Porta, indeed, claimed the invention as his own, and is believed to have hastened his death, (which happened in 1615, he being then 80 years old,) by the fatigue of composing a Treatise on the Telescope, in which he had promised to exhaust the subject. We do not know whether this is the same work which was published after his death by Stelliola,[†] but which contains no allusion to Porta's claim, and possibly Stelliola may have thought it most for his friend's reputation to suppress it. Schott[‡] says, a friend of his had seen Porta's book in manuscript, and that it did at that time contain the assertion of Porta's title to the invention. After all it is not improbable that he may have derived his notions of magnifying distant objects from our celebrated countryman Roger Bacon, who died about the year 1300. He has been supposed, not without good grounds, to have been one of the first who recognised the use of single lenses in producing distinct vision, and he has some expressions with respect to their combination which promise effects analogous to those held out by Porta. In "The Admirable Force of Art and Nature," he says, "Physical figurations are far more strange, for in such manner may we frame perspects and looking-glasses that one thing shall appear to be many, as one man shall seeme a whole armie; and divers sunnes and moones, yea, as many as we please, shall appeare at one time, &c. And so may the perspects be framed, that things most farre off may seeme most nigh unto us, and clean contrarie, soe that we may reade very small letters an incredible distance from us, and behold things how little soever they be, and make stars to appeare wheresoever we will, &c. And, besides all these, we may so frame perspects that any man entering into a house he shall indeed see gold, and silver, and precious stones, and what else he will, but when he maketh haste to the place he shall find just nothing." It seems plain, that the author is here speaking solely of mirrors, and we must not too hastily draw the conclusion, because in the first and last of these assertions he is, to a certain extent, borne out by facts, that he therefore was in possession of a method of accomplishing the middle problem also. In the previous chapter, he gives a long list of notable things, (much in the style of the Marquis of Worcester's Century of Inventions) which if we can really persuade ourselves that he was capable of accomplishing, we must allow the present age to be still immeasurably inferior to him in science.

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[*] Si utrumque recte componere noveris, et longinqua et proxima majora et clara videbis.—Mag. Nat. lib. 17.

[†] The passage in the original, which is printed alike in the editions of 1598, 1607, 1619, and 1650, is as follows: Visus constituatur centro valentissimus speculi, ubi fiet, et valentissimè universales solares radii disperguntur, et coeunt minimè, sed centro prædicti speculi in illius medio, ubi diametri transversales, omnium ibi concursus. Constituitur hoc modo speculum concavum columnare æquidistantibus lateribus, sed lateri uno obliquo sectionibus illis accommodetur, trianguli vero obtusianguli, vel orthogonii secentur, hinc inde duobus transversalibus lineis, ex centro eductis. Et confectum erit specillum, ad id, quod diximus, utile.

[*] Diximus de Ptolemæi *speculo*, sive *specillo* potius, quo per sexcentena millia pervenientes naves conspiciebat.

[†] Il Telescopio, 1627.

[‡] Magia Naturæ et Artis Herbipoli, 1657.

Thomas Digges, in the preface to his Pantometria, (published in 1591) declares, "My father, by his continuall painfull practises, assisted with demonstrations mathematicall, was able, and sundry times hath by proportionall glasses, duely situate in convenient angles, not only discouered things farre off, read letters, numbered peeces of money, with the verye coyne and superscription thereof, cast by some of his freends of purpose, upon downes in open fields; but also, seuen miles off, declared what hath beene doone at that instant in priuate places. He hath also sundrie times, by the sunne beames, fired powder and dischargde ordnance halfe a mile and more distante; which things I am the boulder to report, for that there are yet living diverse (of these his dooings) occulati testes, (eye witnesses) and many other matters farre more strange and rare, which I omit as impertinent to this place."

We find another pretender to the honour of the discovery of the telescope in the celebrated Antonio de Dominis, Archbishop of Spalatro, famous in the annals of optics for being one of the first to explain the theory of the rainbow. Montucla, following P. Boscovich, has scarcely done justice to De Dominis, whom he treats as a mere pretender and ignorant person. The indisposition of Boscovich towards him is sufficiently accounted for by the circumstance of his being a Catholic prelate who had embraced the cause of Protestantism. His nominal reconciliation with the Church of Rome would probably not have saved him from the stake, had not a natural death released him when imprisoned on that account at Rome. Judgment was pronounced upon him notwithstanding, and his body and books were publicly burnt in the Campo de' Fiori, in 1624. His treatise, De Radiis, (which is very rarely to be met with) was published by Bartolo after the acknowledged invention of the telescope by Galileo; but Bartolo tells us, in the preface, that the manuscript was communicated to him from a collection of papers written 20 years before, on his inquiring the Archbishop's opinion with respect to the newly discovered instrument, and that he got leave to publish it, "with the addition of one or two chapters." The treatise contains a complete description of a telescope, which, however, is professed merely to be an improvement on spectacles, and if the author's intention had been to interpolate an afterwritten account, in order to secure to himself the undeserved honour of the invention, it seems improbable that he would have suffered an acknowledgment of additions, previous to publication, to be inserted in the preface. Besides, the whole tone of the work is that of a candid and truth-seeking philosopher, very far indeed removed from being, as Montucla calls him, conspicuous for ignorance even among the ignorant men of his age. He gives a drawing of a convex and concave lens, and traces the passage of the rays through them; to which he subjoins, that he has not satisfied himself with any determination of the precise distance to which the glasses should be separated, according to their convexity and concavity, but recommends the proper distance to be found by actual experiment, and tells us, that the effect of the instrument will be to prevent the confusion arising from the interference of the direct and refracted rays, and to magnify the object by increasing the visible angle under which it is viewed. These, among the many claimants, are certainly the authors who approached the most nearly to the discovery: and the reader may judge, from the passages cited, whether the knowledge of the telescope can with probability be referred to a period earlier than the commencement of the 17th century. At all events, we can find no earlier trace of its being applied to any practical use; the knowlege, if it existed, remained speculative and barren.

In 1609, Galileo, then being on a visit to a friend at Venice, heard a rumour of the recent invention, by a Dutch spectacle-maker, of an instrument which was said to represent distant objects nearer than they usually appeared. According to his own account, this general rumour, which was confirmed to him by letters from Paris, was all that he learned on the subject; and returning to Padua, he immediately applied himself to consider the means by which such an effect could be produced. Fuccarius, in an abusive letter which he wrote on the subject, asserts that one of the Dutch telescopes had been at that time actually brought to Venice, and that he (Fuccarius) had seen it; which, even if true, is perfectly consistent with Galileo's statement; and in fact the question, whether or not Galileo saw the original instrument, becomes important only from his expressly asserting the contrary, and professing to give the train of reasoning by which he discovered its principle; so that any insinuation that he had actually seen the Dutch glass, becomes a direct impeachment of his veracity. It is certain, from the following extract of a letter from Lorenzo Pignoria to Paolo Gualdo, that one at least of the Dutch glasses had been sent to Italy. It is dated Padua, 31st August, 1609.[*] "We have no news, except the return of His Serene Highness, and the reelection of the lecturers, among whom Sign. Galileo has contrived to get 1000 florins for life; and it is said to be on account of an eyeglass, *like the one which was sent from Flanders to Cardinal Borghese*. We have seen some here, and truly they succeed well."

It is allowed by every one that the Dutchman, or rather Zealander, made his discovery by mere accident, which greatly derogates from any honour attached to it; but even this diminished degree of credit has been fiercely disputed. According to one account, which appears consistent and probable, it had been made for sometime before its importance was in the slightest degree understood or appreciated, but was set up in the optician's shop as a curious philosophical toy, showing a large and inverted image of a weathercock, towards which it was directed. The Marquis Spinola, chancing to see it, was struck with the phenomenon, purchased the instrument, and presented it either to the Archduke Albert of Austria, or to Prince Maurice of Nassau, whose name appears in every version of the story, and who first entertained the idea of employing it in military reconnoissances.

Zacharias Jansen, and Henry Lipperhey, two spectacle-makers, living close to each other, near the church of Middleburg, have both had strenuous supporters of their title to the invention. A third pretender appeared afterwards in the person of James Metius of Alkmaer, who is mentioned by Huyghens and Des Cartes, but his claims rest upon no authority whatever comparable to that which supports the other two. About half a century afterwards, Borelli was at the pains to collect and publish a number of letters and depositions which he procured, as well on one side as on the other.[†] It seems that the truth lies between them, and that one, probably Jansen, was the inventor of the *microscope*, which application of the principle was unquestionably of an earlier date, perhaps as far back as 1590. Jansen gave one of his microscopes to the Archduke, who gave it to Cornelius Drebbel, a salaried mathematician at the court of our James the first, where William Borelli (not the author above mentioned) saw it many years afterwards, when ambassador from the United Provinces to England, and got from Drebbel this account of the quarter whence it came. Lipperhey afterwards, in 1609, accidentally hit upon the *telescope*, and on the fame of this discovery it would not be difficult for Jansen, already in possession of an instrument so much resembling it, to perceive the slight difference between them, and to construct a telescope independently of Lipperhey, so that each, with some show of reason, might claim the priority of the invention. A notion of this kind reconciles the testimony of many conflicting witnesses on the subject, some of whom do not seem to distinguish very accurately whether the telescope or microscope is the instrument to which their evidence refers. Borelli arrives at the conclusion, that Jansen was the inventor; but not satisfied with this, he endeavours, with a glaring partiality which makes his former determination suspicious, to secure for him and his son the more solid reputation of having anticipated Galileo in the useful employment of the invention. He has however inserted in his collections a letter from John the son of Zacharias, in which John, omitting all mention of his father, speaks of his own observation of the satellites of Jupiter, evidently seeking to insinuate that they were earlier than Galileo's; and in this sense the letter has since been quoted,* although it appears from John's own deposition, preserved in the same collection, that at the time of their discovery he could not have been more than six years old. An oversight of this sort throws doubt on the whole of the pretended observations, and indeed the letter has much the air of being the production of a person imperfectly informed on the subject on which he writes, and probably was compiled to suit Borelli's purposes, which were to make Galileo's share in the invention appear as small as possible.

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[*] Lettère d'Uomini illustri. Venezia, 1744.

[†] Borelli. De vero Telescopii inventore, 1655.

Galileo himself gives a very intelligible account of the process of reasoning, by which he detected the secret.—"'I argued in the following manner. The contrivance consists either of one glass or of more—one is not sufficient, since it must be either convex, concave, or plane; the last does not produce any sensible alteration in objects, the concave diminishes them: it is true that the convex magnifies, but it renders them confused and indistinct; consequently, one glass is insufficient to produce the desired effect. Proceeding to consider two glasses, and bearing in mind that the plane glass causes no change, I determined that the instrument could not consist of the combination of a plane glass with either of the other two. I therefore applied myself to make experiments on combinations of the two other kinds, and thus obtained that of which I was in search." It has been urged against Galileo that, if he really invented the telescope on theoretical principles, the same theory ought at once to have conducted him to a more perfect instrument than that which he at first constructed;* but it is plain, from this statement, that he does not profess to have theorized beyond the determination of the species of glass which he should employ in his experiments, and the rest of his operations he avows to have been purely empirical. Besides, we must take into account the difficulty of grinding the glasses, particularly when fit tools were yet to be made, and something must be attributed to Galileo's eagerness to bring his results to the test of actual experiment, without waiting for that improvement which a longer delay might and did suggest. Galileo's language bears a resemblance to the first passage which we quoted from Baptista Porta, sufficiently close to make it not improbable that he might be assisted in his inquiries by some recollection of it, and the same passage seems, in like manner, to have recurred to the mind of Kepler, as soon as he heard of the invention. Galileo's telescope consisted of a plano-convex and plano-concave lens, the latter nearest the eye, distant from each other by the difference of their focal lengths, being, in principle, exactly the same with the modern opera-glass. He seems to have thought that the Dutch glass was the same, but this could not be the case, if the above quoted particular of the *inverted* weathercock, which belongs to most traditions of the story, be correct; because it is the peculiarity of this kind of telescope not to invert objects, and we should be thus furnished with a demonstrative proof of the falsehood of Fuccarius's insinuation: in that case the Dutch glass must have been similar to what was afterwards called the astronomical telescope, consisting of two convex glasses distant from each other by the sum of their focal lengths. This supposition is not controverted by the fact, that this sort of telescope was never employed by astronomers till long afterwards; for the fame of Galileo's observations, and the superior excellence of the instruments constructed under his superintendence, induced every one in the first instance to imitate his constructions as closely as possible. The astronomical telescope was however eventually found to possess superior advantages over that which Galileo imagined, and it is on this latter principle that all modern refracting telescopes are constructed; the inversion being counteracted in those which are intended for terrestrial observations, by the introduction of a second pair of similar glasses, which restore the inverted image to its original position. For further details on the improvements which have been subsequently introduced, and on the reflecting telescope, which was not brought into use till the latter part of the century, the reader is referred to the Treatise on OPTICAL INSTRUMENTS.

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* Encyclopædia Britannica. Art. TELESCOPE.

* Ibid.

Galileo, about the same time, constructed microscopes on the same principle, for we find that, in 1612, he presented one to Sigismund, King of Poland; but his attention being principally devoted to the employment and perfection of his telescope, the microscope remained a long time imperfect in his hands: twelve years later, in 1624, he wrote to P. Federigo Cesi, that he had delayed to send the microscope, the use of which he there describes, because he had only just brought it to perfection, having experienced some difficulty in working the glasses. Schott tells an amusing story, in his "Magic of Nature," of a Bavarian philosopher, who, travelling in the Tyrol with one of the newly invented microscopes about him, was taken ill on the road and died. The authorities of the village took possession of his baggage, and were proceeding to perform the last duties to his body, when, on examining the little glass instrument in his pocket, which chanced to contain a flea, they were struck with the greatest astonishment and terror, and the poor Bavarian, condemned by acclamation as a sorcerer who was in the habit of using a portable familiar, was declared unworthy of Christian burial. Fortunately for his character, some bold sceptic ventured to open the instrument, and discovered the true nature of the imprisoned fiend.

As soon as Galileo's first telescope was completed, he returned with it to Venice, and the extraordinary sensation which it excited tends also strongly to refute Fuccarius's assertion that the Dutch glass was already known there. During more than a month Galileo's whole time was employed in exhibiting his instrument to the principal inhabitants of Venice, who thronged to his house to satisfy themselves of the truth of the wonderful stories in circulation; and at the end of that time the Doge, Leonardo Donati, caused it to be intimated to him that such a present would not be deemed unacceptable by the senate. Galileo took the hint, and his complaisance was rewarded by a mandate confirming him for life in his professorship at Padua, at the same time doubling his yearly salary, which was thus made to amount to 1000 florins.

It was long before the phrenzy of public curiosity abated. Sirturi describes a ludicrous violence which was done to himself, when, with the first telescope which he had succeeded in making, he went up into the tower of St. Mark, at Venice, in the vain hope of being there entirely unmolested. Unluckily he was seen by some idlers in the street: a crowd soon collected round him, who insisted on taking possession of his instrument, and, handing it one to the other, detained him there for several hours till their curiosity was satiated, when he was allowed to return home. Hearing them also inquire eagerly at what inn he lodged, he thought it better to quit Venice early the next morning, and prosecute his observations in a less inquisitive neighbourhood.* Instruments of an inferior description were soon manufactured, and vended everywhere as philosophical playthings, much in the way in which, in our own time, the kaleidoscope spread over Europe as fast as travellers could carry them. But the fabrication of a better sort was long confined, almost solely, to Galileo and those whom he immediately instructed; and so late as the year 1637, we find Gaertner, or as he chose to call himself, Hortensius, assuring Galileo that none could be met with in Holland sufficiently good to show Jupiter's disc well defined; and in 1634 Gassendi begs for a telescope from Galileo, informing him that he was unable to procure a good one either in Venice, Paris, or Amsterdam.

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* Telescopium. Venetiis, 1619.

The instrument, on its first invention, was generally known by the names of Galileo's tube, the perspective, the double eye-glass: the names of telescope and microscope were suggested by Demisiano, as we are told by Lagalla in his treatise on the Moon.*

Chapter VII.

Discovery of Jupiter's satellites—Kepler—Sizzi—Astrologers—Mæstlin—Horky—Mayer.

As soon as Galileo had provided himself with a second instrument, he began a careful examination of the heavenly bodies, and a series of splendid discoveries soon rewarded his diligence. After considering the beautiful appearances which the varied surface of the moon presented to this new instrument, he turned his telescope towards Jupiter, and his attention was soon arrested by the singular position of three small stars, near the body of that planet, which appeared almost in a straight line with it, and in the direction of the ecliptic. The following evening he was surprised to find that two of the three which had been to the eastward of the planet, now appeared on the contrary side, which he could not reconcile with the apparent motion of Jupiter among the fixed stars, as given by the tables. Observing these night after night, he could not fail to remark that they changed their relative positions. A fourth also appeared, and in a short time he could no longer refuse to believe that these small stars were four moons, revolving round Jupiter in the same manner in which our earth is accompanied by its single attendant. In honour of his patron Cosmo, he named them the Medicæan stars. As they are now hardly known by this appellation, his doubts, whether he should call them Medicæan, after Cosmo's family, or Cosmical, from his individual name, are become of less interest.

An extract from a letter which Galileo received on this occasion from the court of France, will serve to show how highly the honour of giving a name to these new planets was at that time appreciated, and also how much was expected from Galileo's first success in examining the heavens. "The second request, but the most pressing one which I can make to you, is, that you should determine, if you discover any other fine star, to call it by the name of the great star of France, as well as the most brilliant of all the earth; and, if it seems fit to you, call it rather by his proper name of Henri, than by the family name of Bourbon: thus you will have an opportunity of doing a thing just and due and proper in itself, and at the same time will render yourself and your family rich and powerful for ever." The writer then proceeds to enumerate the different claims of Henri IV. to this honour, not forgetting that he married into the family of the Medici, &c.

The result of these observations was given to the world, in an Essay which Galileo entitled *Nuncius Sidereus*, or the Intelligencer of the Stars; and it is difficult to describe the extraordinary sensation which its publication produced. Many doubted, many positively refused to believe, so novel an announcement; all were struck with the greatest astonishment, according to their respective opinions, either at the new view of the universe thus offered to them, or at the daring audacity of Galileo in inventing such fables. We shall proceed to extract a few passages from contemporary writers relative to this book, and the discoveries announced in it.

Kepler deserves precedence, both from his own celebrity, and from the lively and characteristic account which he gives of his first receiving the intelligence:—"I was sitting idle at home, thinking of you, most excellent Galileo, and your letters, when the news was brought me of the discovery of four planets by the help of the double eye-glass. Wachenfels stopped his carriage at my door to tell me, when such a fit of wonder seized me at a report which seemed so very absurd, and I was thrown into such agitation at seeing an old dispute between us decided in this way, that between his joy, my colouring, and the laughter of both, confounded as we were by such a novelty, we were hardly capable, he of speaking, or I of listening. My amazement was increased by the assertion of Wachenfels, that those who sent this news from Galileo were celebrated men, far removed by their learning, weight, and character, above vulgar folly; that the book was actually in the press, and would be published immediately. On our separating, the authority of Galileo had the greatest influence on me, earned by the accuracy of his judgment, and excellence of his understanding; so I immediately fell to thinking how there could be any addition to the number of the planets without overturning my Mysterium Cosmographicum, published thirteen years ago, according to which Euclid's five regular solids do not allow more than six planets round the sun."

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* De phænomenis in orbe Lunæ. Venetiis, 1612.

This was one of the many wild notions of Kepler's fanciful brain, among which he was lucky enough at length to hit upon the real and principal laws of the planetary motions. His theory may be briefly given in his own words:—"The orbit of the earth is the measure of the rest. About it circumscribe a dodecahedron. The sphere including this will be that of Mars. About Mars' orbit describe a tetrahedron: the sphere containing this will be Jupiter's orbit. Round Jupiter's describe a cube: the sphere including this will be Saturn's. Within the earth's orbit inscribe an icosahedron: the sphere inscribed in it will be Venus's orbit. In Venus inscribe an octahedron: the sphere inscribed in it will be Mercury's. You have now the reason of the number of the planets:" for as there are no more than the five regular solids here enumerated, Kepler conceived this to be a satisfactory reason why there could be neither more nor less than six planets. His letter continues:—"I am so far from disbelieving the existence of the four circumjovial planets, that I long for a telescope to anticipate you, if possible, in discovering two round Mars, (as the proportion seems to me to require,) six or eight round Saturn, and perhaps one each round Mercury and Venus."

The reader has here an opportunity of verifying Galileo's observation, that Kepler's method of philosophizing differed widely from his own. The proper line is certainly difficult to hit between the mere theorist and the mere observer. It is not difficult at once to condemn the former, and yet the latter will deprive himself of an important, and often indispensable assistance, if he neglect from time to time to consolidate his observations, and thence to conjecture the course of future observation most likely to reward his assiduity. This cannot be more forcibly expressed than in the words of Leonardo da Vinci:* "Theory is the general, experiments are the soldiers. The interpreter of the works of nature is experiment; that is never wrong; it is our judgment which is sometimes deceived, because we are expecting results which experiment refuses to give. We must consult experiment, and vary the circumstances, till we have deduced general rules, for it alone can furnish us with them. But you will ask, what is the use of these general rules? I answer, that they direct us in our inquiries into nature and the operations of art. They keep us from deceiving ourselves and others, by promising ourselves results which we can never obtain."

In the instance before us, it is well known that, adopting some of the opinions of Bruno and Brutti, Galileo, even before he had seen the satellites of Jupiter, had allowed the possibility of the discovery of new planets; and we can scarcely suppose that they had weakened his belief in the probability of further success, or discouraged him from examining the other heavenly bodies. Kepler on the contrary had taken the opposite side of the argument; but no sooner was the fallacy of his first position undeniably demonstrated, than, passing at once from one extreme to the other, he framed an unsupported theory to account for the number of satellites which were round Jupiter, and for those which he expected to meet with elsewhere. Kepler has been styled the legislator of the skies; his laws were promulgated rather too arbitrarily, and they often failed, as all laws must do which are not drawn from a careful observation of the nature of those who are to be governed by them. Astronomers have reason to be grateful for the theorems which he was the first to establish; but so far as regards the progress of the science of inductive reasoning, it is perhaps to be regretted, that the seventeen years which he wasted in random and unconnected guesses should have been finally rewarded, by discoveries splendid enough to shed deceitful lustre upon the method by which he arrived at them.

Galileo himself clearly perceived the fallacious nature of these speculations on numbers and proportions, and has expressed his sentiments concerning them very unequivocally. "How great and common an error appears to me the mistake of those who persist in making their knowledge and apprehension the measure of the apprehension and knowledge of God; as if that alone were perfect, which they understand to be so. But I, on the contrary, observe that

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* Venturi. Essai sur les ouvrages de Leo. da Vinci.

Nature has other scales of perfection, which we cannot comprehend, and rather seem disposed to class among imperfections. For instance, among the relations of different numbers, those appear to us most perfect which exist between numbers nearly related to each other; as the double, the triple, the proportion of three to two, &c.; those appear less perfect which exist between numbers remote from, and prime to each other; as 11 to 7, 17 to 13, 53 to 37, &c.; and most imperfect of all do those appear which exist between incommensurable quantities, which by us are nameless and inexplicable. Consequently, if the task had been given to a man, of establishing and ordering the rapid motions of the heavenly bodies, according to his notions of perfect proportions, I doubt not that he would have arranged them according to the former rational proportions; but, on the contrary, God, with no regard to our imaginary symmetries, has ordered them in proportions not only incommeasurable and irrational, but altogether inappreciable by our intellect. A man ignorant of geometry may perhaps lament, that the circumference of a circle does not happen to be exactly three times the diameter, or in some other assignable proportion to it, rather than such that we have not yet been able to explain what the ratio between them is; but one who has more understanding will know that if they were other than they are, thousands of admirable conclusions would have been lost, and that none of the other properties of the circle would have been true: the surface of the sphere would not be quadruple of a great circle, nor the cylinder be to the sphere as three to two: in short, no part of geometry would be true, and as it now is. If one of our most celebrated architects had had to distribute this vast multitude of fixed stars through the great vault of heaven, I believe he would have disposed them with beautiful arrangements of squares, hexagons, and octagons; he would have dispersed the larger ones among the middle sized and the less, so as to correspond exactly with each other; and then he would think he had contrived admirable proportions: but God, on the contrary, has shaken them out from His hand as if by chance, and we, forsooth, must think that He has scattered them up yonder without any regularity, symmetry, and elegance."

It is worth remarking that the dangerous ideas of aptitude and congruence of numbers had taken such deep and general root, that long afterwards, when the reality of Jupiter's satellites was incontestably established, and Huyghens had discovered a similar satellite near Saturn, he was so rash as to declare his belief, (unwarned by the vast progress which astronomy had made in his own time,) that no more satellites would be discovered, since the one which he discovered near Saturn, with Jupiter's four, and our moon, made up the number six, exactly equal to the number of the principal planets. Every reader knows that this notion, so unworthy the genius of Huyghens, has been since exploded by the discovery both of new planets, and new satellites.

Francesco Sizzi, a Florentine astronomer, took the matter up in a somewhat different strain from Kepler.*—"There are seven windows given to animals in the domicile of the head, through which the air is admitted to the rest of the tabernacle of the body, to enlighten, to warm, and nourish it, which are the principal parts of the μικροκοσμος (or little world); two nostrils, two eyes, two ears, and a mouth; so in the heavens, as in a μακροκοσμος (or great world), there are two favourable stars, two unpropitious, two luminaries, and Mercury alone undecided and indifferent. From which and many other similar phenomena of nature, such as the seven metals, &c., which it were tedious to enumerate, we gather that the number of planets is necessarily seven. Moreover, the satellites are invisible to the naked eye, and therefore can exercise no influence on the earth, and therefore would be useless, and therefore do not exist. Besides, as well the Jews and other ancient nations as modern Europeans have adopted the division of the week into seven days, and have named them from the seven planets: now if we increase the number of the planets this whole system falls to the ground." To these remarks Galileo calmly replied, that whatever their force might be, as a reason for believing beforehand that no more than seven planets would be discovered, they hardly seemed of sufficient weight to destroy the new ones when actually seen.

Others, again, took a more dogged line of opposition, without venturing into the subtle analogies and arguments of the philosopher just cited. They contented themselves, and satisfied others

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Dianoia Astronomica. Venetiis, 1610.

with the simple assertion, that such things were not, and could not be, and the manner in which they maintained themselves in their incredulity was sufficiently ludicrous. "Oh, my dear Kepler,"* says Galileo, "how I wish that we could have one hearty laugh together. Here, at Padua, is the principal professor of philosophy, whom I have repeatedly and urgently requested to look at the moon and planets through my glass, which he pertinaciously refuses to do. Why are you not here? what shouts of laughter we should have at this glorious folly! and to hear the professor of philosophy at Pisa labouring before the grand duke with logical arguments, as if with magical incantations, to charm the new planets out of the sky."

Another opponent of Galileo deserves to be named, were it only for the singular impudence of the charge he ventures to bring against him. "We are not to think," says Christmann, in the Appendix to his *Nodus Gordius*, "that Jupiter has four satellites given him by nature, in order, by revolving round him, to immortalize the name of the Medici, who first had notice of the observation. These are the dreams of *idle men*, who love ludicrous ideas better than our laborious and industrious correction of the heavens.—Nature abhors so horrible a chaos, and to the truly wise such vanity is detestable.

Galileo was also urged by the astrologers to attribute some influence, according to their fantastic notions, to the satellites, and the account which he gives his friend Dini of his answer to one of this class is well worth extracting, as a specimen of his method of uniting sarcasm with serious expostulation; "I must," says he, "tell you what I said a few days back to one of those nativity-casters, who believe that God, when he created the heavens and the stars, had no thoughts beyond what they can themselves conceive, in order to free myself from his tedious importunity; for he protested, that unless I would declare to him the effect of the Medicæan planets, he would reject and deny them as needless and superfluous. I believe this set of men to be of Sizzi's opinion, that astronomers discovered the other seven planets, not by seeing them corporally in the skies, but only from their effects on earth,—much in the manner in which some houses are discovered to be haunted by evil spirits, not by seeing them, but from the extravagant pranks which are played there. I replied, that he ought to reconsider the hundred or thousand opinions which, in the course of his life, he might have given, and particularly to examine well the events which he had predicted with the help of Jupiter, and if he should find that all had succeeded conformably to his predictions, I bid him prophecy merrily on, according to his old and wonted rules; for I assured him that the new planets would not in any degree affect the things which are already past, and that in future he would not be a less fortunate conjuror than he had been: but if, on the contrary, he should find the events depending on Jupiter, in some trifling particulars not to have agreed with his dogmas and prognosticating aphorisms, he ought to set to work to find new tables for calculating the constitution of the four Jovial circulators at every bygone moment, and, perhaps, from the diversity of their aspects, he would be able, with accurate observations and multiplied conjunctions, to discover the alterations and variety of influences depending upon them; and I reminded him, that in ages past they had not acquired knowledge with little labour, at the expense of others, from written books, but that the first inventors acquired the most excellent knowledge of things natural and divine with study and contemplation of the vast book which nature holds ever open before those who have eyes in their forehead and in their brain; and that it was a more honourable and praiseworthy enterprize with their own watching, toil, and study, to discover something admirable and new among the infinite number which yet remain concealed in the darkest depths of philosophy, than to pass a listless and lazy existence, labouring only to darken the toilsome inventions of their neighbours, in order to excuse their own cowardice and inaptitude for reasoning, while they cry out that nothing can be added to the discoveries already made."

The extract given above from Kepler, is taken from an Essay, published with the later editions of the *Nuncius*, the object and spirit of which seem to have been greatly misunderstood, even by some of Kepler's intimate friends.—They considered it as a covert attack upon Galileo, and, accordingly, Maestlin thus writes to him:—"In your Essay

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* Kepleri Epistolæ.

(which I have just received) you have plucked Galileo's feathers well; I mean, that you have shown him not to be the inventor of the telescope, not to have been the first who observed the irregularities of the moon's surface, not to have been the first discoverer of more worlds than the ancients were acquainted with, &c. One source of exultation was still left him, from the apprehension of which Martin Horky has now entirely delivered me." It is difficult to discover in what part of Kepler's book Maestlin found all this, for it is one continued encomium upon Galileo; insomuch that Kepler almost apologizes in the preface for what may seem his intemperate admiration of his friend. "Some might wish I had spoken in more moderate terms in praise of Galileo, in consideration of the distinguished men who are opposed to his opinions, but I have written nothing fulsome or insincere. I praise him, for myself; I leave other men's judgments free; and shall be ready to join in condemnation when some one wiser than myself shall, by sound reasoning, point out his errors." However, Maestlin was not the only one who misunderstood Kepler's intentions: the Martin Horky of whom he speaks, a young German, also signalized himself by a vain attack upon the book which he thought his patron Kepler condemned. He was then travelling in Italy, whence he wrote to Kepler his first undetermined thoughts about the new discoveries. "They are wonderful; they are stupendous; whether they are true or false I cannot tell."[*] He seems soon to have decided that most reputation was to be gained on the side of Galileo's opponents, and his letters accordingly became filled with the most rancorous abuse of him. At the same time, that the reader may appreciate Horky's own character, we shall quote a short sentence at the end of one of his letters, where he writes of a paltry piece of dishonesty with as great glee as if he had solved an ingenious and scientific problem. After mentioning his meeting Galileo at Bologna, and being indulged with a trial of his telescope, which, he says, "does wonders upon the earth, but represents celestial objects falsely;"[†] he concludes with the following honourable sentence:—"I must confide to you a theft which I committed. I contrived to take a mould of the glass in wax, without the knowledge of any one, and, when I get home, I trust to make a telescope even better than Galileo's own."

Horky having declared to Kepler, "I will never concede his four new planets to that Italian from Padua though I die for it," followed up this declaration by publishing a book against Galileo, which is the one alluded to by Maestlin, as having destroyed the little credit which, according to his view, Kepler's publication had left him. This book professes to contain the examination of four principal questions touching the alleged planets; 1st, Whether they exist? 2nd, What they are? 3rd, What they are like? 4th, Why they are? The first question is soon disposed of, by Horky's declaring positively that he has examined the heavens with Galileo's own glass, and that no such thing as a satellite about Jupiter exists. To the second, he declares solemnly, that he does not more surely know that he has a soul in his body, than that reflected rays are the sole cause of Galileo's erroneous observations. In regard to the third question, he says, that these planets are like the smallest fly compared to an elephant; and, finally, concludes on the fourth, that the only use of them is to gratify Galileo's "thirst of gold," and to afford himself a subject of discussion.[*]

Galileo did not condescend to notice this impertinent folly; it was answered by Roffini, a pupil of Magini, and by a young Scotchman of the name of Wedderburn, then a student at Padua, and afterwards a physician at the Court of Vienna. In the latter reply we find it mentioned, that Galileo was also using his telescope for the examination of insects,

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[*] Kepleri Epistolæ.

[†] It may seem extraordinary that any one could support an argument by this partial disbelief in the instrument, which was allowed on all hands to represent terrestial objects correctly. A similar instance of obstinacy, in an almost identical case though in a more unpretending station, once came under the writer's own observation. A farmer in Cambridgeshire, who had acquired some confused notions of the use of the quadrant, consulted him on a new method of determining the distances and magnitudes of the sun and moon, which he declared were far different from the quantities usually assigned to them. After a little conversation, the root of his error, certainly sufficiently gross, appeared to be that he had confounded the angular measure of a degree, with 69½ miles, the linear measure of a degree on the earth's surface. As a short way of showing his mistake, he was desired to determine, in the same manner, the height of his barn which stood about 30 yards distant; he lifted the quadrant to his eye, but perceiving, probably, the monstrous size to which his principles were forcing him, he said, "Oh, Sir, the quadrant's only true for the sky." He must have been an objector of this kind, who said to Galileo,—"Oh, Sir, the telescope's only true for the earth."

[*] Venturi.

&c.* Horky sent his performance triumphantly to Kepler, and, as he returned home before receiving an answer, he presented himself before his patron in the same misapprehension under which he had written, but the philosopher received him with a burst of indignation which rapidly undeceived him. The conclusion of the story is characteristic enough to be given in Kepler's own account of the matter to Galileo, in which, after venting his wrath against this "scum of a fellow," whose "obscurity had given him audacity," he says, that Horky begged so hard to be forgiven, that "I have taken him again into favour upon this preliminary condition, to which he has agreed:—that I am to shew him Jupiter's satellites, AND HE IS TO SEE THEM, and own that they are there."

In the same letter Kepler writes, that although he has himself perfect confidence in the truth of Galileo's assertions, yet he wishes he could furnish him with some corroborative testimonies, which Kepler could quote in arguing the point with others. This request produced the following reply, from which the reader will also learn the new change which had now taken place in Galileo's fortunes, the result of the correspondence with Florence, part of which we have already extracted.† "In the first place, I return you my thanks that you first, and almost alone, before the question had been sifted (such is your candour and the loftiness of your mind), put faith in my assertions. You tell me you have some telescopes, but not sufficiently good to magnify distant objects with clearness, and that you anxiously expect a sight of mine, which magnifies images more than a thousand times. It is mine no longer, for the Grand Duke of Tuscany has asked it of me, and intends to lay it up in his museum, among his most rare and precious curiosities, in eternal remembrance of the invention: I have made no other of equal excellence, for the mechanical labour is very great: I have, however, devised some instruments for figuring and polishing them which I am unwilling to construct here, as they could not conveniently be carried to Florence, where I shall in future reside. You ask, my dear Kepler, for other testimonies:—I produce, for one, the Grand Duke, who, after observing the Medicæan planets several times with me at Pisa during the last months, made me a present, at parting, worth more than a thousand florins, and has now invited me to attach myself to him with the annual salary of one thousand florins, and with the title of Philosopher and Principal Mathematician to His Highness; without the duties of any office to perform, but with the most complete leisure; so that I can complete my Treatises on Mechanics, on the Constitution of the Universe, and on Natural and Violent Local Motion, of which I have demonstrated geometrically many new and admirable phenomena. I produce, for another witness, myself, who, although already endowed in this college with the noble salary of one thousand florins, such as no professor of mathematics ever before received, and which I might securely enjoy during my life, even if these planets had deceived me and should disappear, yet quit this situation, and betake me where want and disgrace will be my punishment should I prove to have been mistaken."

It is difficult not to regret that Galileo should be thus called on to resign his best glasses, but it appears probable that on becoming more familiar with the Grand Duke, he ventured to suggest that this telescope would be more advantageously employed in his own hands, than pompously laid up in a museum; for in 1637 we find him saying, in answer to a request from his friend Micanzio to send him a telescope—"I am sorry that I cannot oblige you with the glasses for your friend, but I am no longer capable of making them, and I have just parted with two tolerably good ones which I had, reserving only my old discoverer of celestial novelties which is already promised to the Grand Duke." Cosmo was dead in 1637, and it is his son Ferdinand who is here meant, who appears to have inherited his father's love of science. Galileo tells us, in the same letter, that Ferdinand had been amusing himself for some months with making object-glasses, and always carried one with him to work at wherever he went.

When forwarding this telescope to Cosmo in the first instance, Galileo adds, with a very natural feeling—"I send it to his highness unadorned and unpolished, as I made it for my own use, and beg that it may always be left in the same state; for none of the old parts ought to be displaced to make room for new ones, which will have had no share in the watchings and fatigues of these observations." A telescope was in existence, though with the object glass broken, at the end of the last century, and probably still is in the Museum at Florence, which was shewn as the discoverer of Jupiter's satellites. Nelli, on whose authority this is mentioned, appears to question its genuineness. The first reflecting telescope, made with Newton's own hands, and scarcely possessing less interest than the first of Galileo's, is preserved in the library of the Royal Society.

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* Quatuor probl. confut. per J. Wedderbornium, Scotobritannum. Patavii. 1610.

† See page 18.

By degrees the enemies of Galileo and of the new stars found it impossible to persevere in their disbelief, whether real or pretended, and at length seemed resolved to compensate for the sluggishness of their perception, by its acuteness when brought into action. Simon Mayer published his "Mundus Jovialis" in 1614, in which he claims to have been an original observer of the satellites, but, with an affectation of candour, allows that Galileo observed them probably about the same time. The earliest observation which he has recorded is dated 29th December, 1609, but, not to mention the total want of probability that Mayer would not have immediately published so interesting a discovery, it is to be observed, that, as he used the old style, this date of 29th December agrees with the 8th January, 1610, of the new style, which was the date of Galileo's second observation, and Galileo ventured to declare his opinion, that this pretended observation was in fact a plagiarism.

Scheiner counted five, Rheita nine, and other observers, with increasing contempt for Galileo's imperfect announcements, carried the number as high as twelve.[*] In imitation of Galileo's nomenclature, and to honour the sovereigns of the respective observers, these supposed additional satellites were dignified with the names of Vladislavian, Agrippine, Urbanoctavian, and Ferdinandotertian planets; but a very short time served to show it was as unsafe to exceed as to fall short of the number which Galileo had fixed upon, for Jupiter rapidly removed himself from the neighbourhood of the fixed stars, which gave rise to these pretended discoveries, carrying with him only his four original attendants, which continued in every part of his orbit to revolve regularly about him.

Perhaps we cannot better wind up this account of the discovery of Jupiter's satellites, and of the intense interest they have at all times inspired, than in the words of one who inherits a name worthy to be ranked with that of Galileo in the list of astronomical discoverers, and who takes his own place among the most accomplished mathematicians of the present times. "The discovery of these bodies was one of the first brilliant results of the invention of the telescope; one of the first great facts which opened the eyes of mankind to the system of the universe, which taught them the comparative insignificance of their own planet, and the superior vastness and nicer mechanism of those other bodies, which had before been distinguished from the stars only by their motion, and wherein none but the boldest thinkers had ventured to suspect a community of nature with our own globe. This discovery gave the holding turn to the opinions of mankind respecting the Copernican system; the analogy presented by these little bodies (little however only in comparison with the great central body about which they revolve) performing their beautiful revolutions in perfect harmony and order about it, being too strong to be resisted. This elegant system was watched with all the curiosity and interest the subject naturally inspired. The eclipses of the satellites speedily attracted attention, and the more when it was discerned, as it speedily was, by Galileo himself, that they afforded a ready method of determining the difference of longitudes of distant places on the earth's surface, by observations of the instants of their disappearances and reappearances, simultaneously made. Thus the first astronomical solution of the great problem of the longitude, the first mighty step which pointed out a connection between speculative astronomy and practical utility, and which, replacing the fast dissipating dreams of astrology by nobler visions, showed how the stars might really, and without fiction, be called arbiters of the destinies of empires, we owe to the satellites of Jupiter, those atoms imperceptible to the naked eye, and floating like motes in the beam of their primary—itself an atom to our sight, noticed only by the careless vulgar as a large star, and by the philosophers of former ages as something moving among the stars, they knew not what, nor why: perhaps only to perplex the wise with fruitless conjectures, and harass the weak with fears as idle as their theories."[*]

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[*] Sherburne's Sphere of Manilius. London, 1675.

[*] Herschel's Address to the Astronomical Society, 1827.

CHAPTER VIII.

Observations on the Moon—Nebulæ—Saturn—Venus—Mars.

THERE were other discoveries announced in Galileo's book of great and unprecedented importance, and which scarcely excited less discussion than the controverted Medicæan planets. His observations on the moon threw additional light on the constitution of the solar system, and cleared up the difficulties which encumbered the explanation of the varied appearance of her surface. The different theories current at that day, to account for these phenomena, are collected and described by Benedetti, and also with some liveliness, in a mythological poem, by Marini.* We are told, that, in the opinion of some, the dark shades on the moon's surface arise from the interposition of opaque bodies floating between her and the sun, which prevents his light from reaching those parts: others thought, that on account of her vicinity to the earth, she was partly tainted with the imperfection of our terrestrial and elementary nature, and was not of that entirely pure and refined substance of which the more remote heavens consist: a third party looked on her as a vast mirror, and maintained that the dark parts of her surface were the reflected images of our earthly forests and mountains.

Galileo's glass taught him to believe that the surface of this planet, far from being smooth and polished, as was generally taken for granted, really resembled our earth in its structure; he was able distinctly to trace on it the outlines of mountains and other inequalities, the summits of which reflected the rays of the sun before these reached the lower parts, and the sides of which, turned from his beams, lay buried in deep shadow. He recognised a distribution into something similar to continents of land, and oceans of water, which reflect the sun's light to us with greater or less vivacity, according to their constitution. These conclusions were utterly odious to the Aristotelians; they had formed a preconceived notion of what the moon ought to be, and they loathed the doctrines of Galileo, who took delight, as they said, in distorting and ruining the fairest works of nature. It was in vain he argued, as to the imaginary perfection of the spherical form, that although the moon, or the earth, were it absolutely smooth, would indeed be a more perfect sphere than in its present rough state, yet touching the perfection of the earth, considered as a natural body calculated for a particular purpose, every one must see that absolute smoothness and sphericity would make it not only less perfect, but as far from being perfect as possible. "What else," he demanded, "would it be but a vast unblessed desert, void of animals, of plants, of cities and of men; the abode of silence and inaction; senseless, lifeless, soulless, and stript of all those ornaments which make it now so various and so beautiful?"

He reasoned to no purpose with the slaves of the ancient schools: nothing could console them for the destruction of their smooth unalterable surface, and to such an absurd length was this hallucination carried, that one opponent of Galileo, Lodovico delle Colombe, constrained to allow the evidence of the sensible inequalities of the moon's surface, attempted to reconcile the old doctrine with the new observations, by asserting, that every part of the moon, which to the terrestrial observer appeared hollow and sunken, was in fact entirely and exactly filled up with a clear crystal substance, perfectly imperceptible by the senses, but which restored to the moon her accurately spherical and smooth surface. Galileo met the argument in the manner most fitting, according to one of Aristotle's own maxims, that "it is foolish to refute absurd opinions with too much curiosity." "Truly," says he, "the idea is admirable, its only fault is that it is neither demonstrated nor demonstrable; but I am perfectly ready to believe it, provided that, with equal courtesy, I may be allowed to raise upon your smooth surface, crystal mountains (which nobody can perceive) ten times higher than those which I have actually seen and measured." By threatening to proceed to such extremities, he seems to have scared the opposite party into moderation, for we do not find that the crystalline theory was persevered in.

In the same essay, Galileo also explained at some length the cause of that part of the moon being visible, which is unenlightened directly by the sun in her first and last quarter. Maestlin, and before him Leonardo da Vinci, had already declared this to arise from what may be called *earthshine*, or the reflection of the sun's light from the terrestrial globe, exactly similar to that which the moon affords us when we are similarly placed between her and the sun; but the notion had not been favourably received, because one of the arguments against the earth being a planet, revolving like the rest round the sun, was, that it did not shine like them, and was therefore of a different nature; and this argument, weak as it was in itself, the theory of terrestrial reflection completely overturned. The more popular opinions ascribed this feeble light, some to the fixed stars, some to Venus, some to the rays of the sun, penetrating and shining through the moon. Even the sagacious Benedetti adopted the notion of this light being caused by Venus, in the same sentence in which he explains the true reason of the faint light observed during a total eclipse of the moon, pointing out that it is occasioned by those rays of the sun, which reach the moon, after being bent round the sides of the earth by the action of our atmosphere.*

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* Adone di Marini, Venetiis, 1623, Cant. x.

Galileo also announced the detection of innumerable stars, invisible to the unassisted sight; and those remarkable appearances in the heavens, generally called nebulæ, the most considerable of which is familiar to all under the name of the milky way, when examined by his instrument, were found to resolve themselves into a vast collection of minute stars, too closely congregated to produce a separate impression upon the unassisted eye.† Benedetti, who divined that the dark shades on the moon's surface arose from the constitution of those parts which suffered much of the light to pass into them, and consequently reflected a less portion of it, had maintained that the milky way was the result of the converse of the same phenomenon, and declared, in the language of his astronomy, that it was a part of the eighth orb, which did not, like the rest, allow the sun's light to traverse it freely, but reflected a small part feebly to our sight.

The Anti-Copernicans would probably have been well pleased, if by these eternally renewed discussions and disputes, they could have occupied Galileo's time sufficiently to detain his attention from his telescope and astronomical observations; but he knew too well where his real strength lay, and they had scarcely time to compound any thing like an argument against him and his theories, before they found him in possession of some new facts, which they were unprepared to meet, otherwise than by the never-failing resource of abuse and affected contempt. The year had not expired before Galileo had new intelligence to communicate of the highest importance. Perhaps he had been taught caution from the numerous piracies which had been committed upon his discoveries, and he first announced his new discoveries enigmatically, veiling their real import by transpositions of the letters in the words which described them, (a practice then common, and not disused even at a much later date,) and inviting all astronomers to declare, within a certain time, if they had noted any thing new in the heavens worthy of observation. The transposed letters which he published were—

"*Smaismrmilme poeta leumi bone nugttaviras.*"

Kepler, in the true spirit of his riddling philosophy, endeavoured to decypher the meaning, and fancied he had succeeded when he formed a barbarous Latin verse,

"*Salve umbistineum geminatum Martia proles,*"

conceiving that the discovery, whatever it might be, related to the planet Mars, to which Kepler's attention had before been particularly directed. The reader, however, need not weary himself in seeking a translation of this solution, for at the request of the Emperor Rodolph, Galileo speedily sent to him the real reading—

Altissimum planetam tergeminum observavi;

that is, "I have observed that the most distant planet is triple," or, as he further explains the matter, "I have with great admiration observed that Saturn is not a single star, but three together, which as it were touch each other; they have no relative motion, and are constituted in this form oOo the middle being somewhat larger than the lateral ones. If we examine them with an eye-glass which magnifies the surface less than 1000 times, the three stars do not appear very distinctly, but Saturn has an oblong appearance, like the appearance of an olive, thus ⊖. Now I have discovered a court for Jupiter, and two servants for this old man, who aid his steps and never quit his side." Galileo was, however, no match in this style of writing for Kepler, who disapproved his friend's metaphor, and, in his usual fanciful and amusing strain,—"I will not," said he, "make an old man of Saturn, nor slaves of his attendant globes, but rather let this tricorporate form be Geryon, so shall Galileo be Hercules, and the telescope his club; armed with which, he has conquered that distant planet, and dragged him from the remotest depths of nature, and exposed him to the view of all." Galileo's glass was not of sufficient power to shew him the real constitution of this extraordinary planet; it was reserved for Huyghens, about the year 1656, to declare to the world that these supposed attendant stars are in fact part of a ring which surrounds, and yet is completely distinct from the body of Saturn;* and the still more accurate observations of Herschel have ascertained that it consists of two concentric rings revolving round the planet, and separated from each other by a space which our most powerful telescopes scarcely enable us to measure.

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* Speculat. Lib Venetiis, 1585, Epistolæ.

† This opinion, with respect to the milky way, had been held by some of the ancient astronomers. *See* Manilius. Lib. i. v. 753.

"*Anne magis densâ stellarum turba coronâ*
Contexit flammas, et crasso lumine candet,
Et fulgore nitet collato clarior orbis."

Galileo's second statement concluded with the remark, that "in the other planets nothing new was to be observed;" but a month had scarcely elapsed, before he communicated to the world another enigma,

Hæc immatura à me jam frustra leguntur oy,

which, as he said, contained the announcement of a new phenomenon, in the highest degree important to the truth of the Copernican system. The interpretation of this is,

Cynthiæ figuras æmulatur mater amorum,

that is to say,—Venus rivals the appearances of the moon—for Venus being now arrived at that part of her orbit in which she is placed between the earth and the sun, and consequently, with only a part of her enlightened surface turned towards the earth, the telescope shewed her in a crescent form, like the moon in a similar position, and tracing her through the whole of her orbit round the sun, or at least so long as she was not invisible from his overpowering light, Galileo had the satisfaction of seeing the enlightened portion in each position assume the form appropriate to that hypothesis. It was with reason, therefore, that he laid stress on the importance of this observation, which also established another doctrine scarcely less obnoxious to the Anti-Copernicans, namely, that a new point of resemblance was here found between the earth and one of the principal planets; and as the reflection from the earth upon the moon had shewn it to be luminous like the planets when subjected to the rays of the sun, so this change of apparent figure demonstrated that one of the planets not near the earth, and therefore probably all, were in their own nature not luminous, and only reflected the sun's light which fell upon them; an inference, of which the probability was still farther increased a few years later by the observation of the transit of Mercury over the sun's disc.

It is curious that only twenty-five years before this discovery of the phases (or appearances) of Venus, a commentator of Aristotle, under the name of Lucillus Philalthæus, had advanced the doctrine that all the planets except the moon are luminous of themselves, and in proof of his assertion had urged, "that if the other planets and fixed stars received their light from the sun, they would, as they approached and receded from him, or as he approached and receded from them, assume the same phases as the moon, which, he adds, we have never yet observed."—He further remarks, "that Mercury and Venus would, in the supposed case of their being nearer the earth than the sun, eclipse it occasionally, just as eclipses are occasioned by the moon." Perhaps it is still more remarkable, that these very passages, in which the reasoning is so correct, though the facts are too hastily taken for granted, (the common error of that school,) are quoted by Benedetti, expressly to shew the ignorance and presumption of the author. Copernicus, whose want of instruments had prevented him from observing the horned appearance of Venus when between the earth and sun, had perceived how formidable an obstacle the non-appearance of this phenomenon presented to his system; he endeavoured, though unsatisfactorily, to account for it by supposing that the rays of the sun passed freely through the body of the planet, and Galileo takes occasion to praise him for not being deterred from adopting the system, which, on the whole, appeared to agree best with the phenomena, by meeting with some which it did not enable him to explain. Milton, whose poem is filled with allusions to Galileo and his astronomy, has not suffered this beautiful phenomenon to pass unnoticed. After describing the creation of the Sun, he adds:—

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* Huyghens announced his discovery in this form: *a a a a a a a c c c c c d e e e e e g h i i i i i i i l l l l m m n n n n n n n n n o o o o p p q r r s t t t t t u u u u u*, which he afterwards recomposed into the sentence. *Annulo cingitur, tenui, plano, nusquam cohærente, ad eclipticam inclinato.* De Saturni Lunâ. Hagæ, 1656.

> Hither, as to their fountain, other stars
> Repairing, in their golden urns draw light,
> And hence the morning planet gilds her horns.*

Galileo also assured himself, at the same time, that the fixed stars did not receive their light from the sun. This he ascertained by comparing the vividness of their light, in all positions, with the feebleness of that of the distant planets, and by observing the different degrees of brightness with which all the planets shone at different distances from the sun. The more remote planets did not, of course, afford equal facilities with Venus for so decisive an observation; but Galileo thought he observed, that when Mars was in quadratures, (or in the quarters, the middle points of his path on either side,) his figure varied slightly from a perfect circle. Galileo concludes the letter, in which he announces these last observations to his pupil Castelli, with the following expressions, shewing how justly he estimated the opposition they encountered:—"You almost make me laugh by saying that these clear observations are sufficient to convince the most obstinate: it seems you have yet to learn that long ago the observations were enough to convince those who are capable of reasoning, and those who wish to learn the truth; but that to convince the obstinate, and those who care for nothing beyond the vain applause of the stupid and senseless vulgar, not even the testimony of the stars would suffice, were they to descend on earth to speak for themselves. Let us then endeavour to procure some knowledge for ourselves, and rest contented with this sole satisfaction; but of advancing in popular opinion, or gaining the assent of the book-philosophers, let us abandon both the hope and the desire."

CHAPTER IX.

Account of the Academia Lincea—Del Cimento—Royal Society.

GALILEO'S resignation of the mathematical professorship at Padua occasioned much dissatisfaction to all those who were connected with that university. Perhaps not fully appreciating his desire of returning to his native country, and the importance to him and to the scientific world in general, of the complete leisure which Cosmo secured to him at Florence, (for by the terms of his diploma he was not even required to reside at Pisa, nor to give any lectures, except on extraordinary occasions, to sovereign princes and other strangers of distinction,) the Venetians remembered only that they had offered him an honourable asylum when almost driven from Pisa; that they had increased his salary to four times the sum which any previous professor had enjoyed; and, finally, by an almost unprecedented decree, that they had but just secured him in his post during the remainder of his life. Many took such offence as to refuse to have any further communication with him; and Sagredo, a constant friend of Galileo, wrote him word that he had been threatened with a similar desertion unless he should concur in the same peremptory resolution, which threats, however, Sagredo, at the same time, intimates his intention of braving.

Early in the year 1611, Galileo made his first appearance in Rome, where he was received with marks of distinguished consideration, and where all ranks were eager to share the pleasure of contemplating the new discoveries. "Whether we consider cardinal, prince, or prelate, he found an honourable reception from them all, and had their palaces as open and free to him as the houses of his private friends."* Among other distinctions he was solicited to become a member of the newly-formed philosophical society, the once celebrated *Academia Lincea*, to which he readily assented. The founder of this society was Federigo Cesi, the Marchese di Monticelli, a young Roman nobleman, the devotion of whose time and fortune to the interests of science has not been by any means rewarded with a reputation commensurate with his deserts. If the energy of his mind had been less worthily employed than in fostering the cause of science and truth, and in extending the advantages of his birth and fortune to as many as were willing to co-operate with him, the name of Federigo Cesi might have appeared more prominently on the page of history. Cesi had scarcely completed his 18th year, when, in 1603, he formed the plan of a philosophical society, which in the first instance consisted only of himself and three of his most intimate friends, Hecke, a Flemish physician, Stelluti, and Anastasio de Filiis. Cesi's father, the Duca d' Acquasparta, who was of an arbitrary and extravagant temper, considered such pursuits and associates as derogatory to his son's rank; he endeavoured to thwart the design by the most violent and unjustifiable proceedings, in consequence of which, Cesi in the beginning of 1605 privately quitted Rome, Hecke was obliged to leave Italy altogether from fear of the Inquisition, which was excited against him, and the academy was for a time virtually dissolved. The details of these transactions are foreign to the present narrative: it will be enough to mention that, in 1609, Cesi, who had never altogether abandoned his scheme, found the opposition decaying which he at first experienced, and with better success he renewed the plan which he had sketched six years before. A few extracts from the Regulations will serve to shew the spirit in which this distinguished society was conceived:—

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* B. vii. v. 364. Other passages may be examined in B. i. 286; iii. 565—590. 722—733; iv. 589; v. 261, 414; vii. 577; viii. 1—178.

* Salusbury, Math. Coll.

"The Lyncean Society desires for its academicians, philosophers eager for real knowledge, who will give themselves to the study of nature, and especially to mathematics; at the same time it will not neglect the ornaments of elegant literature and philology, which like a graceful garment adorn the whole body of science.—In the pious love of wisdom, and to the praise of the most good and most high God, let the Lynceans give their minds, first to observation and reflection, and afterwards to writing and publishing.—It is not within the Lyncean plan to find leisure for recitations and declamatory assemblies; the meetings will neither be frequent nor full, and chiefly for transacting the necessary business of the society: but those who wish to enjoy such exercises will in no respect be hindered, provided they attend them as accessory studies, decently and quietly, and without making promises and professions of how much they are about to do. For there is ample philosophical employment for every one by himself, particularly if pains are taken in travelling and in the observation of natural phenomena, and in the book of nature which every one has at home, that is to say, the heavens and the earth; and enough may be learned from the habits of constant correspondence with each other, and alternate offices of counsel and assistance.—Let the first fruits of wisdom be love; and so let the Lynceans love each other as if united by the strictest ties, nor suffer any interruption of this sincere bond of love and faith, emanating from the source of virtue and philosophy.—Let them add to their names the title of Lyncean, which has been advisedly chosen as a warning and constant stimulus, especially when they write on any literary subject, also in their private letters to their associates, and in general when any work comes from them wisely and well performed.—The Lynceans will pass over in silence all political controversies and quarrels of every kind, and wordy disputes, especially gratuitous ones, which give occasion to deceit, unfriendliness, and hatred; like men who desire peace, and seek to preserve their studies free from molestation, and to avoid every sort of disturbance. And if any one by command of his superiors, or from some other necessity, is reduced to handle such matters, since they are foreign to physical and mathematical science, and consequently alien to the object of the Academy, let them be printed without the Lyncean name."*

The society which was eventually organized formed but a very trifling part of the comprehensive scheme which Cesi originally proposed to himself; it had been his wish to establish a scientific Order which should have corresponding lodges in the principal towns of Europe, and in other parts of the globe, each consisting of not more than five nor less than three members, besides an unlimited number of Academicians not restricted to any particular residence or regulations. The mortifications and difficulties to which he was subjected from his father's unprincipled behaviour, render it most extraordinary and admirable that he should have ventured to undertake even so much as he actually carried into execution. He promised to furnish to the members of his society such assistance as they might require in the prosecution of their respective researches, and also to defray the charges

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[*] Perhaps it was to deprecate the hostility of the Jesuits that, at the close of these Regulations, the Lynceans are directed to address their prayers, among other Saints, especially to Ignatius Loyola, as to one who greatly favoured the interests of learning. Odescalchi. Memorie dell' Acad. de' Lincei, Roma. 1806.

of publishing such of their works as should be thought worthy of appearing with the common sanction. Such liberal offers were not likely to meet with an unfavourable reception: they were thankfully accepted by many well qualified to carry his design into execution, and Cesi was soon enabled formally to open his academy, the distinctive title of which he borrowed from the Lynx, with reference to the piercing sight which that animal has been supposed to possess. This quality seemed to him an appropriate emblem of those which he desired to find in his academicians, for the purpose of investigating the secrets of nature; and although, at the present day, the name may appear to border on the grotesque, it was conceived in the spirit of the age, and the fantastic names of the numberless societies which were rapidly formed in various parts of Italy far exceed whatever degree of quaintness may be thought to belong to the Lyncean name. The Inflamed—the Transformed—the Uneasy—the Humorists—the Fantastic—the Intricate—the Indolent—the Senseless—the Undeceived—the Valiant—the Ætherial Societies are selected from a vast number of similar institutions, the names of which, now almost their sole remains, are collected by the industry of Morhof and Tiraboschi*. The Humorists' are named by Morhof as the only Italian philosophical society anterior to the Lynceans; their founder was Paolo Mancino, and the distinctive symbol which they adopted was rain dropping from a cloud, with the motto *Redit agmine dulci*;—their title is derived from the same metaphor. The object of their union appears to have been similar to that of the Lynceans, but they at no time attained to the celebrity to which Cesi's society rose from the moment of its incorporation. Cesi took the presidency for his life; and the celebrated Baptista Porta was appointed vice president at Naples. Stelluti acted as the legal representative of the society, with the title of procuratore. Of the other two original members Anastasio de Filiis was dead, and although Hecke returned to Italy in 1614, and rejoined the Academy, yet he was soon afterwards struck off the list in consequence of his lapsing into insanity. Among the academicians we find the names of Galileo, Fabio Colonna, Lucas Valerio, Guiducci, Welser, Giovanni Fabro, Terrentio, Virginio Cesarini, Ciampoli, Molitor, Cardinal Barberino, (nephew of Pope Urban VIII.) Stelliola, Salviati, &c.

The principal monument still remaining of the zeal and industry to which Cesi incited his academicians is the Phytobasanos, a compendium of the natural history of Mexico, which must be considered a surprising performance for the times in which it appeared. It was written by a Spaniard named Hernandez; and Reccho, who often has the credit of the whole work, made great additions to it. During fifty years the manuscript had been neglected, when Cesi discovered it, and employed Terrentio, Fabro, and Colonna, all Lynceans, to publish it enriched with their notes and emendations. Cesi himself published several treatises, two of which are extant; his *Tabulæ Phytosophicæ*, and a Dissertation on Bees entitled *Apiarium*, the only known copy of which last is in the library of the Vatican. His great work, *Theatrum Naturæ*, was never printed; a circumstance which tends to shew that he did not assemble the society round him for the purpose of ministering to his own vanity, but postponed the publication of his own productions to the labours of his coadjutors. This, and many other valuable works belonging to the academy existed in manuscript till lately in the Albani Library at Rome. Cesi collected, not a large, but an useful library for the use of the academy, (which was afterwards augmented on the premature death of Cesarini by the donation of his books); he filled a botanical garden with the rarer specimens of plants, and arranged a museum of natural curiosities; his palace at Rome was constantly open to the academicians; his purse and his influence were employed with equal liberality in their service.

Cesi's death, in 1632, put a sudden stop to the prosperity of the society, a consequence which may be attributed to the munificence with which he had from the first sustained it: no one could be found to fill his place in the princely manner to which the academicians were accustomed, and the society, after lingering some years under the nominal patronage of Urban VIII., gradually decayed, till, by the death of its principal members, and dispersion of the rest, it became entirely extinct*. Bianchi, whose sketch of the academy was almost the only one till the appearance of Odescalchi's history, made an attempt to revive it in the succeeding century, but without any permanent effect. A society under the same name has been formed since 1784, and is still flourishing in Rome. Before leaving the subject it may be mentioned, that one of the earliest notices that Bacon's works were known in Italy is to be found in a letter to Cesi, dated 1625; in which Pozzo, who had gone to Paris with Cardinal Barberino, mentions having seen them there with great admiration, and suggests that Bacon would be a fit person to be proposed as a member of their society. After Galileo's death, three of his principal followers, Viviani, Torricelli, and Aggiunti formed the plan of establishing a similar philosophical society, and though Aggiunti and Torricelli died before the scheme could be realized, Viviani pressed it forward, and, under the auspices of Ferdinand II., formed a society, which, in 1657, merged in the famous *Academia del Cimento*, or Experimental Academy. This latter held its occasional meetings at the palace of Ferdinand's brother, Leopold de' Medici: it was composed chiefly, if not entirely, of Galileo's pupils and friends. During the few years that this society lasted, one of the principal objects of which was declared to be the repetition and developement of Galileo's experiments, it kept up a correspondence with the principal philosophers in every part of Europe, but when Leopold was, in 1666, created a cardinal, it appears to have been dissolved, scarcely ten years after its institution[†]. This digression may be excused in favour of so interesting an establishment as the Academia Lincea, which preceded by half a century the formation of the Royal Society of London, and Académie Françoise of Paris.

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* Polyhistor Literarius, &c.—Storia della Letterat. Ital. The still existing society of Chaff, more generally known by its Italian title, Della Crusca, belongs to the same period.

* F. Columnæ Phytobasanus Jano Planco Auctore. Florent, 1744.

These latter two are mentioned together, probably for the first time, by Salusbury. The passage is curious in an historical point of view, and worth extracting:—"In imitation of these societies, Paris and London have erected theirs of *Les Beaux Esprits*, and of the *Virtuosi*: the one by the countenance of the most eminent Cardinal Richelieu, the other by the royal encouragement of his sacred Majesty that now is. The *Beaux Esprits* have published sundry volumes of their moral and physiological conferences, with the laws and history of their fellowship; and I hope the like in due time from our Royal Society; that so such as envie their fame and felicity, and such as suspect their ability and candor, may be silenced and disappointed in their detractions and expectations."[*]

CHAPTER X.

Spots on the Sun—Essay on Floating Bodies—Scheiner—Change in Saturn.

GALILEO did not indulge the curiosity of his Roman friends by exhibiting only the wonders already mentioned, which now began to lose the gloss of novelty, but disclosed a new discovery, which appeared still more extraordinary, and, to the opposite faction, more hateful than anything of which he had yet spoken. This was the discovery, which he first made in the month of March, 1611, of dark spots on the body of the sun. A curious fact, and one which well serves to illustrate Galileo's superiority in seeing things simply as they are, is, that these spots had been observed and recorded centuries before he existed, but, for want of careful observation, their true nature had been constantly misapprehended. One of the most celebrated occasions was in the year 807 of our era, in which a dark spot is mentioned as visible on the face of the sun during seven or eight days. It was then supposed to be Mercury[†]. Kepler, whose astronomical knowledge would not suffer him to overlook that it was impossible that Mercury could remain so long in conjunction with the sun, preferred to solve the difficulty by supposing that, in Aimoin's original account, the expression was not *octo dies* (eight days), but *octoties*—a barbarous word, which he supposed to have been written for *octies* (eight times); and that the other accounts (in which the number of days mentioned is different) copying loosely from the first, had both mistaken the word, and misquoted the time which they thought they found mentioned there. It is impossible to look on this explanation as satisfactory, but Kepler, who at that time did not dream of spots on the sun, was perfectly contented with it. In 1609, he himself observed upon the sun a black spot, which he in like manner mistook for Mercury, and unluckily the day, being cloudy, did not allow him to contemplate it sufficiently long to discover his error, which the slowness of its apparent motion would soon have pointed out.* He hastened to publish his supposed observation, but no sooner was Galileo's discovery of the solar spots announced, than he, with that candour which as much as his flighty disposition certainly characterized him at all times, retracted his former opinion, and owned his belief that he had been mistaken. In fact it is known from the more accurate theory which we now possess of Mercury's motions, that it did not pass over the sun's face at the time when Kepler thought he perceived it there.

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[*] Nelli Saggio di Storia Literaria Fiorentina, Lucca, 1759.

[*] Salusbury's Math. Coll. vol. ii. London, 1664.

[†] Aimoini Hist. Francorum. Parisiis. 1567.

Galileo's observations were in their consequences to him particularly unfortunate, as in the course of the controversy in which they engaged him, he first became personally embroiled with the powerful party, whose prevailing influence was one of the chief causes of his subsequent misfortunes. Before we enter upon that discussion, it will be proper to mention another famous treatise which Galileo produced soon after his return from Rome to Florence, in 1612. This is, his Discourse on Floating Bodies, which restored Archimedes' theory of hydrostatics, and has, of course, met with the opposition which few of Galileo's works failed to encounter. In the commencement, he thought it necessary to apologize for writing on a subject so different from that which chiefly occupied the public attention, and declared that he had been too closely occupied in calculating the periods of the revolutions of Jupiter's satellites to permit him to publish anything earlier. These periods he had succeeded in determining during the preceding year, whilst at Rome, and he now announced them to complete their circuits, the first in about 1 day, 18½ hours; the second in 3 days, 13 hours, 20 minutes; the third in 7 days, 4 hours; and the outermost in 16 days, 18 hours. All these numbers he gave merely as approximately true, and promised to continue his observations, for the purpose of correcting the results. He then adds an announcement of his recent discovery of the solar spots, "which, as they change their situation, offer a strong argument, either that the sun revolves on itself, or that, perhaps, other stars, like Venus and Mercury, revolve about it, invisible at all other times, on account of the small distance to which they are removed from him." To this he afterwards subjoined, that, by continued observation, he had satisfied himself that these solar spots were in actual contact with the surface of the sun, where they are continually appearing and disappearing; that their figures were very irregular, some being very dark, and others not so black; that one would often divide into three or four, and, at other times, two, three, or more would unite into one; besides which, that they had all a common and regular motion, with which they revolved 'round with the sun, which turned upon its axis in about the time of a lunar month.

Having by these prefatory observations assuaged the public thirst for astronomical novelties, he ventures to introduce the principal subject of the treatise above mentioned. The question of floating bridges had been discussed at one of the scientific parties, assembled at the house of Galileo's friend Salviati, and the general opinion of the company appearing to be that the floating or sinking of a body depended principally upon its shape, Galileo undertook to convince them of their error. If he had not preferred more direct arguments, he might merely have told them that in this instance they were opposed to their favourite Aristotle, whose words are very unequivocal on the point in dispute. "Form is not the cause why a body moves downwards rather than upwards, but it does affect the swiftness with which it moves;"* which is exactly the distinction which those who called themselves Aristotelians were unable to perceive, and to which the opinions of Aristotle himself were not always true. Galileo states the discussion to have immediately arisen from the assertion of some one in the company, that condensation is the effect of cold, and ice was mentioned as an instance. On this, Galileo observed, that ice is rather water rarefied than condensed, the proof of which is, that ice always floats upon water.† It was replied, that the reason of this phenomenon was, not the superior lightness of the ice, but its incapacity, owing to its flat shape, to penetrate and overcome the resistance of the water. Galileo denied this, and asserted that ice of any shape would float upon water, and that, if a flat piece of ice were forcibly taken to the bottom, it would of itself rise again to the surface. Upon this assertion it appears that the conversation became so clamorous, that Galileo thought it pertinent to commence his Essay with the following observation on the advantage of delivering scientific opinions in writing, "because in conversational arguments, either one or other party, or perhaps both, are apt to get overwarm, and to speak overloud, and either do not suffer each other to be heard, or else, transported with the obstinacy of not yielding, wander far away from the original proposition, and confound both themselves and their auditors with the novelty and variety of their assertions." After this gentle rebuke he proceeds with his argument, in which he takes occasion to state the famous hydrostatical paradox, of which the earliest notice is to be found in Stevin's works, a contemporary Flemish engineer, and refers it to a principle on which we shall enlarge in another chapter. He then explains the true theory of buoyancy, and refutes the false reasoning on which the contrary opinions were founded, with a variety of experiments.

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* Mercurius in sole visus. 1609.

* De Cœlo. lib. 4.

† For a discussion of this singular phenomenon, see Treatise on Heat, p. 12; and it is worth while to remark in passing, what an admirable instance it affords of Galileo's instantaneous abandonment of a theory so soon as it became inconsistent with experiment.

The whole value and interest of experimental processes generally depends on a variety of minute circumstances, the detail of which would be particularly unsuited to a sketch like the present one. For those who are desirous of becoming more familiar with Galileo's mode of conducting an argument, it is fortunate that such a series of experiments exists as that contained in this essay; experiments which, from their simplicity, admit of being for the most part concisely enumerated, and at the same time possess so much intrinsic beauty and characteristic power of forcing conviction. They also present an admirable specimen of the talent for which Galileo was so deservedly famous, of inventing ingenious arguments in favour of his adversaries' absurd opinions before he condescended to crush them, shewing that nothing but his love of truth stood in the way of his being a more subtle sophist than any amongst them. In addition to these reasons for giving these experiments somewhat in detail, is the fact that all explanation of one of the principal phenomena to which they allude is omitted in many more modern treatises on Hydrostatics; and in some it is referred precisely to the false doctrines here confuted.

The marrow of the dispute is included in Galileo's assertion, that "The diversity of figure given to any solid cannot be in any way the cause of its absolutely sinking or floating; so that if a solid, when formed for example into a spherical figure, sinks or floats in the water, the same body will sink or float in the same water, when put into any other form. The breadth of the figure may indeed retard its velocity, as well of ascent as descent, and more and more according as the said figure is reduced to a greater breadth and thinness; but that it may be reduced to such a form as absolutely to put an end to its motion in the same fluid, I hold to be impossible. In this I have met with great contradictors who, producing some experiments, and in particular a thin board of ebony, and a ball of the same wood, and shewing that the ball in water sinks to the bottom*, and that the board if put lightly on the surface floats, have held and confirmed themselves in their opinion with the authority of Aristotle, that the cause of that rest is the breadth of the figure, unable by its small weight to pierce and penetrate the resistance of the water's thickness, which is readily overcome by the other spherical figure."—For the purpose of these experiments, Galileo recommends a substance such as wax, which may be easily moulded into any shape, and with which, by the addition of a few filings of lead, a substance may be readily made of any required specific gravity. He then declares that if a ball of wax of the size of an orange, or bigger, be made in this manner heavy enough to sink to the bottom, but so lightly that if we take from it only one grain of lead it returns to the top; and if the same wax be afterwards moulded into a broad and thin cake, or into any other figure, regular or irregular, the addition of the same grain of lead will always make it sink, and it will again rise when we remove the lead from it.—"But methinks I hear some of the adversaries raise a doubt upon my produced experiment: and, first, they offer to my consideration that the figure, as a figure simply, and disjunct from the matter, works no effect, but requires to be conjoined with the matter; and, moreover, not with every matter, but with those only wherewith it may be able to execute the desired operation. Just as we see by experience that an acute and sharp angle is more apt to cut than an obtuse; yet always provided that both one and the other are joined with a matter fit to cut, as for instance, steel. Therefore a knife with a fine and sharp edge cuts bread or wood with much ease, which it will not do if the edge be blunt and thick; but if, instead of steel, any one will take wax and mould it into a knife, undoubtedly he will never learn the effects of sharp and blunt edges, because neither of them will cut; the wax being unable, by reason of its flexibility, to overcome the hardness of the wood and bread. And therefore, applying the like discourse to our argument, they say that the difference of figure will shew different effects with regard to floating and sinking, but not conjoined with any kind of matter, but only with those matters which by their weight are able to overcome the viscosity of the water (like the ebony which they have selected); and he that will select cork or other light wood to form solids of different figures, would in vain seek to find out what operation figure has in sinking or floating, because all would swim, and that not through any property of this or that figure, but through the debility of the matter."

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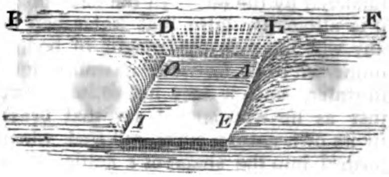
* Ebony is one of the few woods heavier than water. *See* Treatise on Hydrostatics.

"When I begin to examine one by one all the particulars here produced, I allow not only that figures, simply as such, do not operate in natural things, but also that they are never separated from the corporeal substance, nor have I ever alleged them to be stript of sensible matter: and also I freely admit, that in our endeavours to examine the diversity of accidents which depend upon the variety of figures, it is necessary to apply them to matters which obstruct not the various operations of those various figures. I admit and grant that I should do very ill if I were to try the influence of a sharp edge with a knife of wax, applying it to cut an oak, because no sharpness in wax is able to cut that very hard wood. But yet, such an experiment of this knife would not be beside the purpose to cut curded milk, or other very yielding matter; nay, in such matters, the wax is more convenient than steel for finding the difference depending on the acuteness of the angles, because milk is cut indifferently with a razor, or a blunt knife. We must therefore have regard not only to the hardness, solidity, or weight of the bodies which, under different figures, are to divide some matters asunder; but also, on the other hand, to the resistance of the matter to be penetrated. And, since I have chosen a matter which does penetrate the resistance of the water, and in all figures descends to the bottom, my antagonists can charge me with no defect; nor (to revert to their illustration) have I attempted to test the efficacy of acuteness by cutting with matters unable to cut. I subjoin withal, that all caution, distinction, and election of matter would be superfluous and unnecessary, if the body to be cut should not at all resist the cutting: if the knife were to be used in cutting a mist, or smoke, one of paper would serve the purpose as well as one of Damascus steel; and I assert that this is the case with water, and that there is not any solid of such lightness or of such a figure, that being put on the water it will not divide and penetrate its thickness; and if you will examine more carefully your thin boards of wood, you will see that they have part of their thickness under water; and, moreover, you will see that the shavings of ebony, stone, or metal, when they float, have not only thus broken the continuity of the water, but are with all their thickness under the surface of it; and that more and more, according as the floating substance is heavier, so that a thin floating plate of lead will be lower than the surface of the surrounding water by at least twelve times the thickness of the plate, and gold will dive below the level of the water almost twenty times the thickness of the plate, as I shall shew presently."

In order to illustrate more clearly the non-resistance of water to penetration, Galileo then directs a cone to be made of wood or wax, and asserts that when it floats, either with its base or point in the water, the solid content of the part immersed will be the same, although the point is, by its shape, better adapted to overcome the resistance of the water to division, if that were the cause of the buoyancy. Or the experiment may be varied by tempering the wax with filings of lead, till it sinks in the water, when it will be found that in any figure the same cork must be added to it to raise it to the surface.—"This silences not my antagonists; but they say that all the discourse hitherto made by me imports little to them, and that it serves their turn, that they have demonstrated in one instance, and in such manner and figure as pleases them best, namely, in a board and a ball of ebony, that one, when put into the water, sinks to the bottom, and that the other stays to swim at the top; and the matter being the same, and the two bodies differing in nothing but in figure, they affirm that with all perspicuity they have demonstrated and sensibly manifested what they undertook. Nevertheless I believe, and think I can prove that this very experiment proves nothing against my theory. And first it is false that the ball sinks, and the board not; for the board will sink too, if you do to both the figures as the words of our question require; that is, if you put them both *in* the water; for to be in the water implies to be placed in the water, and by Aristotle's own definition of place, to be placed imports to be environed by the surface of the ambient body; but when my antagonists shew the floating board of ebony, they put it not into the water, but upon the water; where, being detained by a certain impediment (of which more anon) it is surrounded, partly with water, partly with air, which is contrary to our agreement, for that was that the bodies should be in the water, and not part in the water, part in the air. I will not omit another reason, founded also upon experience, and, if I deceive not myself, conclusive against the notion that figure, and the resistance of the water to penetration have anything to do with the buoyancy of bodies. Choose a piece of wood or other matter, as for instance walnut-wood, of which a ball rises from the bottom of the water to the surface more slowly than a ball of ebony of the same size sinks, so that clearly the ball of ebony divides the water more readily in sinking than does the walnut in rising. Then take a board of walnut-tree equal to and like the floating ebony one of my antagonists; and if it be true that this latter floats by reason of the figure being unable to penetrate the water, the other of walnut-tree, without all question, if thrust to the bottom ought to stay there, as having the same impeding figure, and being less apt to overcome the said resistance of the water. But if we find by experience that not only the thin board, but every other figure of the same walnut-tree will return to float, as unquestionably we shall, then I must desire my opponents to forbear to attribute the floating of the ebony to the figure of the board, since the resistance of the water is the same in rising as in sinking, and the force of ascension of the walnut-tree is less than the ebony's force for going to the bottom."

"Now, let us return to the thin plate of gold or silver, or the thin board of ebony, and let us lay it lightly upon the water, so that it may stay there without sinking, and carefully observe the effect. It will appear clearly that the plates are a considerable matter lower than the surface of the water which rises up, and makes a kind of rampart round them on every side, in the manner shewn in the annexed figure, in which B D L F represents the surface of the water, and A E I O the surface of the plate. But if it have already penetrated and overcome the continuity of the water, and is of its own nature heavier than the water, why does it not continue to sink, but stop and suspend itself in that little dimple that its weight has made in the water? My answer is, because in sinking till its surface is below the water which rises up in a bank round it, it draws after and carries along with it the air above it, so that that which in this case descends and is placed in the water, is not only the board of ebony or plate of iron, but a compound of ebony and air, from which composition results a solid no longer specifically heavier than the water, as was the ebony or gold alone. But, Gentlemen, we want the same matter; you are to alter nothing but the shape, and therefore have the goodness to remove this air, which may be done simply by washing the upper surface of the board, for the water having once got between the board and air will run together, and the ebony will go to the bottom; and if it does not, you have won the day. But methinks I hear some of my antagonists cunningly opposing this, and telling me that they will not on any account allow their board to be wetted, because the weight of the water so added, by making it heavier than it was before, draws it to the bottom, and that the addition of new weight is contrary to our agreement, which was that the matter should be the same."



"To this I answer first, that nobody can suppose bodies to be put into the water without their being wet, nor do I wish to do more to the board than you may do to the ball. Moreover, it is not true that the board sinks on account of the weight of the water added in the washing; for I will put ten or twenty drops on the floating board, and so long as they stand separate it shall not sink; but if the board be taken out, and all that water wiped off, and the whole surface bathed with one single drop, and put it again upon the water, there is no question but it will sink, the other water running to cover it, being no longer hindered by the air. In the next place it is altogether false that water can in any way increase the weight of bodies immersed in it, for water has no weight in water, since it does not sink. Now, just as he who should say that brass by its own nature sinks, but that when formed into the shape of a kettle, it acquires from that figure a virtue of lying in the water without sinking, would say what is false, because that is not purely brass which then is put into the water, but a compound of brass and air; so is it neither more nor less false, that a thin plate of brass or ebony swims by virtue of its dilated and broad figure. Also I cannot omit to tell my opponents, that this conceit of refusing to bathe the surface of the board, might beget an opinion in a third person of a poverty of arguments on their side, especially as the conversation began about flakes of ice, in which it would be simple to require that the surfaces should be kept dry; not to mention that such pieces of ice, whether wet or dry, always float, and as my antagonists say, because of their shape."

"Some may wonder that I affirm this power to be in the air of keeping the plate of brass or silver above water, as if in a certain sense I would attribute to the air a kind of magnetic virtue for sustaining heavy bodies with which it is in contact. To satisfy all these doubts, I have contrived the following experiment to demonstrate how truly the air does support these solids; for I have found, when one of these bodies which floats when placed lightly on the water, is thoroughly bathed and sunk to the bottom, that by carrying down to it a little air without otherwise touching it in the least, I am able to raise and carry it back to the top, where it floats as before. To this effect I take a ball of wax, and with a little lead make it just heavy enough to sink very slowly to the bottom, taking care that its surface be quite smooth and even. This, if put gently into the water, submerges almost entirely, there remaining visible only a little of the very top, which, so long as it is joined to the air, keeps the ball afloat; but if we take away the contact of the air by wetting this top, the ball sinks to the bottom, and remains there. Now to make it return to the surface by virtue of the air which before sustained it, thrust into the water a glass, with the mouth downwards, which will carry with it the air it contains; and move this down towards the ball, until you see by the transparency of the glass that the air has reached the top of it; then gently draw the glass upwards, and you will see the ball rise, and afterwards stay on the top of the water, if you carefully part the glass and water without too much disturbing it*. There is therefore a certain affinity between the air and other bodies, which holds them united, so that they separate not without a kind of violence, just as between water and other bodies; for in drawing them wholly out of the water, we see the water follow them, and rise sensibly above the level before it quits them." Having established this principle by this exceedingly ingenious and convincing experiment, Galileo proceeds to shew from it what must be the dimensions of a plate of any substance which will float as the wax does, assuming in each case that we know the greatest height at which the rampart of water will stand round it. In like manner he shows that a pyramidal or conical figure may be made of any substance, such that by help of the air, it shall rest upon the water without wetting more than its base; and that we may so form a cone of any substance that it shall float if placed gently on the surface, with its point downwards, whereas no care or pains will enable it to float with its base downwards, owing to the different proportions of air which in the two positions remain connected with it. With this parting blow at his antagonist's theory we close our extracts from this admirable essay.

The first elements of the theory of running waters were reserved for Castelli, an intimate friend and pupil of Galileo. On the present occasion, Castelli appeared as the ostensible author of a defence against the attacks made by Vincenzio di Grazia and by Lodovico delle Columbe (the author of the crystalline composition of the moon) on the obnoxious theory. After destroying all the objections which they produced, the writer tauntingly bids them remember, that he was merely Galileo's pupil, and consider how much more effectually Galileo himself would have confuted them, had he thought it worth while. It was not known till several years after his death, that this Essay was in fact written by Galileo himself.*

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* In making this very beautiful experiment, it is best to keep the glass a few seconds in the water, to give time for the surface of the ball to dry. It will also succeed with a light needle, if carefully conducted.

These compositions merely occupied the leisure time which he could withhold from the controversy on the solar spots to which we have already alluded. A German Jesuit named Christopher Scheiner, who was professor of mathematics at Ingolstadt, in imitation of Galileo had commenced a series of observations on them, but adopted the theory which, as we have seen, Galileo had examined and rejected, that these spots are planets circulating at some distance from the body of the sun. The same opinion had been taken up by a French astronomer, who in honour of the reigning family called them Borbonian stars. Scheiner promulgated his notions in three letters, addressed to their common friend Welser, under the quaint signature of "*Apelles latens post tabulam.*" Galileo replied to Scheiner's letters by three others, also addressed to Welser, and although the dispute was carried on amid mutual professions of respect and esteem, it laid the foundation of the total estrangement which afterwards took place between the two authors. Galileo's part of this controversy was published at Rome by the Lyncean Academy in 1613. To the last of his letters, written in December, 1612, is annexed a table of the expected positions of Jupiter's satellites during the months of March and April of the following year, which, imperfect as it necessarily was, cannot be looked upon without the greatest interest.

In the same letter it is mentioned that Saturn presented a novel appearance, which, for an instant, almost induced Galileo to mistrust the accuracy of his earlier observations. The lateral appendages of this planet had disappeared, and the accompanying extract will show the uneasiness which Galileo could not conceal at the sight of this phenomenon, although it is admirable to see the contempt with which, even in that trying moment, he expresses his consciousness that his adversaries were unworthy of the triumph they appeared on the point of celebrating.—"Looking on Saturn within these few days, I found it solitary, without the assistance of its accustomed stars, and in short, perfectly round and defined like Jupiter, and such it still remains. Now what can be said of so strange a metamorphosis? are perhaps the two smaller stars consumed, like the spots on the sun? have they suddenly vanished and fled? or has Saturn devoured his own children? or was the appearance indeed fraud and illusion, with which the glasses have for so long a time mocked me, and so many others who have often observed with me. Now perhaps the time is come to revive the withering hopes of those, who, guided by more profound contemplations, have fathomed all the fallacies of the new observations and recognised their impossibility! I cannot resolve what to say in a chance so strange, so new, and so unexpected; the shortness of the time, the unexampled occurrence, the weakness of my intellect, and the terror of being mistaken, have greatly confounded me." These first expressions of alarm are not to be wondered at; however, he soon recovered courage, and ventured to foretel the periods at which the lateral stars would again show themselves, protesting at the same time, that he was in no respect to be understood as classing this prediction among the results which depend on certain principles and sound conclusions, but merely on some conjectures which appeared to him probable. From one of the Dialogues on the System, we learn that this conjecture was, that Saturn might revolve upon his axis, but the period which he assumed is very different from the true one, as might be expected from its being intended to account for a phenomenon of which Galileo had not rightly apprehended the character.

He closed this letter with renewed professions of courtesy and friendship towards Apelles, enjoining Welser not to communicate it without adding his excuses, if he should be thought to dissent too violently from his antagonist's ideas, declaring that his only object was the discovery of truth, and that he had freely exposed his own opinion, which he was still ready to change, so soon as his errors should be made manifest to him;

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* Nelli, Saggio di Stor. Liter. Fiorent.

and that he would consider himself under special obligation to any one who would be kind enough to discover and correct them. These letters were written from the villa of his friend Salviati at Selve near Florence, where he passed great part of his time, particularly during his frequent indispositions, conceiving that the air of Florence was prejudicial to him. Cesi was very anxious for their appearance, since they were (in his own words) so hard a morsel for the teeth of the Peripatetics, and he exhorted Galileo, in the name of the society, "to continue to give them, and the nameless Jesuit, something to gnaw."

Chapter XI.

Letter to Christina, Arch-Duchess of Tuscany—Caccini—Galileo revisits Rome—Inchoffer—Problem of Longitudes.

The uncompromising boldness with which Galileo published and supported his opinions, with little regard to the power and authority of those who advocated the contrary doctrines, had raised against him a host of enemies, who each had objections to him peculiar to themselves, but who now began to perceive the policy of uniting their strength in the common cause, to crush if possible so dangerous an innovator. All the professors of the old opinions, who suddenly found the knowledge on which their reputation was founded struck from under them, and who could not reconcile themselves to their new situation of learners, were united against him; and to this powerful cabal was now added the still greater influence of the jesuits and pseudo-theological party, who fancied they saw in the spirit of Galileo's writings the same inquisitive temper which they had already found so inconvenient in Luther and his adherents. The alarm became greater every day, inasmuch as Galileo had succeeded in training round him a numerous band of followers who all appeared imbued with the same dangerous spirit of innovation, and his favourite scholars were successful candidates for professorships in many of the most celebrated universities of Italy.

At the close of 1613, Galileo addressed a letter to his pupil, the Abbé Castelli, in which he endeavoured to shew that there is as much difficulty in reconciling the Ptolemaic as the Copernican system of the world with the astronomical expressions contained in the Scriptures, and asserted, that the object of the Scriptures not being to teach astronomy, such expressions are there used as would be intelligible and conformable to the vulgar belief, without regard to the true structure of the universe; which argument he afterwards amplified in a letter addressed to Christina, Grand Duchess of Tuscany, the mother of his patron Cosmo. He discourses on this subject with the moderation and good sense which so peculiarly characterized him. "I am," says he, "inclined to believe, that the intention of the sacred Scriptures is to give to mankind the information necessary for their salvation, and which, surpassing all human knowledge, can by no other means be accredited than by the mouth of the Holy Spirit. But I do not hold it necessary to believe, that the same God who has endowed us with senses, with speech, and intellect, intended that we should neglect the use of these, and seek by other means for knowledge which they are sufficient to procure us; especially in a science like astronomy, of which so little notice is taken in the Scriptures, that none of the planets, except the sun and moon, and, once or twice only, Venus under the name of Lucifer, are so much as named there. This therefore being granted, methinks that in the discussion of natural problems we ought not to begin at the authority of texts of Scripture, but at sensible experiments and necessary demonstrations: for, from the divine word, the sacred Scripture and nature did both alike proceed, and I conceive that, concerning natural effects, that which either sensible experience sets before our eyes, or necessary demonstrations do prove unto us, ought not upon any account to be called into question, much less condemned, upon the testimony of Scriptural texts, which may under their words couch senses seemingly contrary thereto.

"Again, to command the very professors of astronomy that they of themselves see to the confuting of their own observations and demonstrations, is to enjoin a thing beyond all possibility of doing; for it is not only to command them not to see that which they do see, and not to understand that which they do understand, but it is to order them to seek for and to find the contrary of that which they happen to meet with. I would entreat these wise and prudent fathers, that they would with all diligence consider the difference that is between opinionative and demonstrative doctrines: to the end that well weighing in their minds with what force necessary inferences urge us, they might the better assure themselves that it is not in the power of the professors of demonstrative sciences to change their opinions at pleasure, and adopt first one side and then another; and that there is a great difference between commanding a mathematician or a philosopher, and the disposing of a lawyer or a merchant; and that the demonstrated conclusions touching the things of nature and of the heavens cannot be changed with the same facility as the opinions are touching what is lawful or not in a contract, bargain, or bill of exchange. Therefore, first let these men apply themselves to examine the arguments of Copernicus and others, and leave the condemning of them as erroneous and heretical to whom it belongeth; yet let them not hope to find such rash and precipitous determinations in the wary and holy fathers, or in the absolute wisdom of him who cannot err, as those into which they suffer themselves to be hurried by some particular affection or interest of their own. In these and such other positions, which are not directly articles of faith, certainly no man doubts but His Holiness hath always an absolute power of admitting or condemning them, but it is not in the power of any creature to make them to be true or false, otherwise than of their own nature, and in fact they are." We have been more particular in extracting these passages, because it has been advanced by a writer of high reputation, that the treatment which Galileo subsequently experienced was solely in consequence of his persisting in the endeavour to prove that the Scriptures were reconcileable with the Copernican theory *, whereas we see here distinctly that, for the reasons we have briefly stated, he regarded this as a matter altogether indifferent and beside the question.

Galileo had not entered upon this discussion till driven to it by a most indecent attack, made on him from the pulpit, by a Dominican friar named Caccini, who thought it not unbecoming his habit or religion to play upon the words of a Scriptural text for the purpose of attacking Galileo and his partisans with more personality *. Galileo complained formally of Caccini's conduct to Luigi Maraffi the general of the Dominicans, who apologised amply to him, adding that he himself was to be pitied for finding himself implicated in all the brutal conduct of thirty or forty thousand monks.

In the mean time, the inquisitors at Rome had taken the alarm, and were already, in 1615, busily employed in collecting evidence against Galileo. Lorini, a brother Dominican of Caccini, had given them notice of the letter to Castelli of which we have spoken, and the utmost address was employed to get the original into their hands, which attempt however was frustrated, as Castelli had returned it to the writer. Caccini was sent for to Rome, settled there with the title of Master of the Convent of St. Mary of Minerva, and employed to put the depositions against Galileo into order. Galileo was not at this time fully aware of the machinations against him, but suspecting something of their nature, he solicited and obtained permission from Cosmo, towards the end of 1615, to make a journey to Rome, for the purpose of more directly confronting his enemies in that city. There was a rumour at the time that this visit was not voluntary, but that Galileo had been cited to appear at Rome. A contemporary declares that he heard this from Galileo himself: at any rate, in a letter which Galileo shortly afterwards wrote to Picchena, the Grand Duke's secretary, he expresses himself well satisfied with the results of this step, whether forced or not, and Querenghi thus describes to the Cardinal d'Este the public effect of his appearance: "Your Eminence would be delighted with Galileo if you heard him holding forth, as he often does, in the midst of fifteen or twenty, all violently attacking him, sometimes in one house, sometimes in another. But he is armed after such fashion that he laughs all of them to scorn—and even if the novelty of his opinions prevents entire persuasion, at least he convicts of emptiness most of the arguments with which his adversaries endeavour to overwhelm him. He was particularly admi-

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* Ce philosophe (Galilée) ne fut point persecuté comme bon astronome, mais comme mauvais théologien. C'est son entêtement à vouloir concilier la Bible avec Copernic qui lui donna des juges. Mais vingt auteurs, surtout parmi les protestans, ont écrit que Galilée fut persecuté et imprisonné pour avoir soutenu que la terre tourne autour du soleil, que ce système a été condanné par l'inquisition comme faux, erroné et contraire à la Bible, &c.—Bergier, Encyclopédie Méthodique, Paris, 1790, Art. SCIENCES HUMAINES.

* Viri Galilæi, quid statis adspicientes in cœlum. *Acts* I. II.

rable on Monday last, in the house of Signor Frederico Ghisilieri; and what especially pleased me was, that before replying to the contrary arguments, he amplified and enforced them with new grounds of great plausibility, so as to leave his adversaries in a more ridiculous plight when he afterwards overturned them all."

Among the malicious stories which were put into circulation, it had been said, that the Grand Duke had withdrawn his favour, which emboldened many, who would not otherwise have ventured on such open opposition, to declare against Galileo. His appearance at Rome, where he was lodged in the palace of Cosmo's ambassador, and whence he kept up a close correspondence with the Grand Duke's family, put an immediate stop to rumours of this kind. In little more than a month he was apparently triumphant, so far as regarded himself; but the question now began to be agitated whether the whole system of Copernicus ought not to be condemned as impious and heretical. Galileo again writes to Picchena, "so far as concerns the clearing of my own character, I might return home immediately; but although this new question regards me no more than all those who for the last eighty years have supported these opinions both in public and private, yet, as perhaps I may be of some assistance in that part of the discussion which depends on the knowledge of truths ascertained by means of the sciences which I profess, I, as a zealous and Catholic Christian, neither can nor ought to withhold that assistance which my knowledge affords; and this business keeps me sufficiently employed." De Lambre, whose readiness to depreciate Galileo's merit we have already noticed and lamented, sneeringly and ungratefully remarks on this part of his life, that "it was scarcely worth while to compromise his tranquillity and reputation, in order to become the champion of a truth which could not fail every day to acquire new partisans by the natural effect of the progress of enlightened opinions." We need not stop to consider what the natural effects might have been if none had at any time been found who thought their tranquillity worthily offered up in such a cause.

It has been hinted by several, and is indeed probable, that Galileo's stay at Rome rather injured the cause (so far as provoking the inquisitorial censures could injure it) which it was his earnest desire to serve, for we cannot often enough repeat the assertion, that it was not the doctrine itself, so much as the free, unyielding manner in which it was supported, which was originally obnoxious. Copernicus had been allowed to dedicate his great work to Pope Paul III., and from the time of its first appearance under that sanction in 1543, to the year 1616, of which we are now writing, this theory was left in the hands of mathematicians and philosophers, who alternately attacked and defended it without receiving either support or molestation from ecclesiastical decrees. But this was henceforward no longer the case, and a higher degree of importance was given to the controversy from the religious heresies which were asserted to be involved in the new opinions. We have already given specimens of the so called philosophical arguments brought against Copernicus; and the reader may be curious to know the form of the theological ones. Those which we select are taken from a work, which indeed did not come forth till the time of Galileo's third visit to Rome, but it is relative to the matter now before us, as it professed to be, and its author's party affected to consider it, a complete refutation of the letters to Castelli and the Archduchess Christina[*].

It was the work of a Jesuit, Melchior Inchoffer, and it was greatly extolled by his companions, "as differing so entirely from the pruriency of the Pythagorean writings." He quotes with approbation an author who, first referring to the first verse of Genesis for an argument that the earth was not created till after the heavens, observes that the whole question is thus reduced to the examination of this purely geometrical difficulty—In the formation of a sphere, does the centre or circumference first come into existence? If the latter (which we presume Melchior's friend found good reason for deciding upon), the consequence is inevitable. The earth is in the centre of the universe.

It may not be unprofitable to contrast the extracts which we have given from Galileo's letters on the same subject with the following passage, which appears one of the most subtle and argumentative which is to be found in Melchior's book. He *professes* to be enumerating and refuting the principal arguments which the Copernicans adduced for the motion of the earth. "Fifth argument. Hell is in the centre of the earth, and in it is a fire tormenting the damned; therefore it is absolutely necessary that the earth is moveable. The antecedent is plain." (Inchoffer then quotes a number of texts of Scripture on which, according to him, the Copernicans relied in proof of this part of the argument.) "The consequent is proved: because fire is the cause of motion, for which reason Pythagoras, who, as Aristotle reports, puts the place of punishment in the centre, perceived that the earth is animate and endowed with action. I answer, even allowing that hell is in the centre of the earth, and a fire in it, I deny the consequence: and for proof I say, if the argument is worth any thing, it proves also that lime-kilns, ovens, and fire-grates are animated and spontaneously moveable. I say, *even allowing* that hell is in the centre of the earth: for Gregory, book 4, dial. chap. 42, says, that he dare not decide rashly on this matter, although he thinks more probable the opinion of those who say that it is under the earth. St. Thomas, in Opusc. 10, art. 31, says: Where hell is, whether in the centre of the earth or at the surface, does not in my opinion, relate to any article of faith; and it is superfluous to be solicitous about such things, either in asserting or denying them. And Opusc. 11, art. 24, he says, that it seems to him that nothing should be rashly asserted on this matter, particularly as Augustin thinks that nobody knows where it is; but I do not, says he, think that it is in the centre of the earth. I should be loth, however, that it should be hence inferred by *some people* that hell is in the earth, that we are ignorant where hell is, and therefore that the situation of the earth is also unknown, and, in conclusion, that it cannot therefore be the centre of the universe. The argument shall be retorted in another fashion: for if the place of the earth is unknown, it cannot be said to be in a great circle, so as to be moved round the sun. Finally I say that in fact it is known where the earth is."

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[*] Tractatus Syllepticus. Romæ, 1633. The title-page of this remarkable production is decorated with an emblematical figure, representing the earth included in a triangle; and in the three corners, grasping the globe with their fore feet, are placed three bees, the arms of Pope Urban VIII. who condemned Galileo and his writings. The motto is "*His fixa quiescit*," "Fixed by these it is at rest."

It is not impossible that some persons adopted the Copernican theory, from an affectation of singularity and freethinking, without being able to give very sound reasons for their change of opinion, of whom we have an instance in Origanus, the astrological instructor of Wallenstein's famous attendant Seni, who edited his work. His arguments in favour of the earth's motion are quite on a level with those advanced on the opposite side in favour of its immobility; but we have not found any traces whatever of such absurdities as these having been urged by any of the leaders of that party, and it is far more probable that they are the creatures of Melchior's own imagination. At any rate it is worth remarking how completely he disregards the real physical arguments, which he ought, in justice to his cause, to have attempted to controvert. His book was aimed at Galileo and his adherents, and it is scarcely possible that he could seriously persuade himself that he was stating and overturning arguments similar to those by which Galileo had made so many converts to the opinions of Copernicus. Whatever may be our judgment of his candour, we may at least feel assured that if this had indeed been a fair specimen of Galileo's philosophy, he might to the end of his life have taught that the earth moved round the sun, or if his fancy led him to a different hypothesis, he might like the Abbé Baliani have sent the earth spinning round the stationary moon, and like him have remained unmolested by pontifical censures. It is true that Baliani owned his opinion to be much shaken, on observing it to be opposed to the decree of those in whose hands was placed the power of judging articles of faith. But Galileo's uncompromising spirit of analytical investigation, and the sober but invincible force of reasoning with which he beat down every sophism opposed to him, the instruments with which he worked, were more odious than the work itself, and the condemnation which he had vainly hoped to avert was probably on his very account accelerated.

Galileo, according to his own story, had in March 1616 a most gracious audience of the pope, Paul V., which lasted for nearly an hour, at the end of which his holiness assured him, that the Congregation were no longer in a humour to listen lightly to calumnies against him, and that so long as he occupied the papal chair, Galileo might think himself out of all danger. But nevertheless he was not allowed to return home, without receiving formal notice not to teach the opinions of Co-pernicious, that the sun is in the centre of the system, and that the earth moves about it, from that time forward, in any manner. That these were the literal orders given to Galileo will be presently proved from the recital of them in the famous decree against him, seventeen years later. For the present, his letters which we have mentioned, as well as one of a similar tendency by Foscarini, a Carmelite friar—a commentary on the book of Joshua by a Spaniard named Diego Zuniga—Kepler's Epitome of the Copernican Theory—and Copernicus's own work, were inserted in the list of forbidden books, nor was it till four years afterwards, in 1620, that, on reconsideration, Copernicus was allowed to be read with certain omissions and alterations then decided upon.

Galileo quitted Rome scarcely able to conceal his contempt and indignation. Two years afterwards this spirit had but little subsided, for in forwarding to the Archduke Leopold his Theory of the Tides, he accompanied it with the following remarks:—"This theory occurred to me when in Rome, whilst the theologians were debating on the prohibition of Copernicus's book, and of the opinion maintained in it of the motion of the earth, which I at that time believed; until it pleased those gentlemen to suspend the book, and declare the opinion false and repugnant to the Holy Scriptures. Now, as I know how well it becomes me to obey and believe the decisions of my superiors, which proceed out of more profound knowledge than the weakness of my intellect can attain to, this theory which I send you, which is founded on the motion of the earth, I now look upon as a fiction and a dream, and beg your highness to receive it as such. But, as poets often learn to prize the creations of their fancy, so, in like manner, do I set some value on this absurdity of mine. It is true that when I sketched this little work, I did hope that Copernicus would not, after 80 years, be convicted of error, and I had intended to develope and amplify it farther, but a voice from heaven suddenly awakened me, and at once annihilated all my confused and entangled fancies."

It might have been predicted, from the tone of this letter alone, that it would not be long before Galileo would again bring himself under the censuring notice of the astronomical hierarchy, and indeed he had, so early as 1610, collected some of the materials for the work which caused the final explosion, and on which he now employed himself with as little intermission as the weak state of his health permitted.

He had been before this time engaged in a correspondence with the court of Spain, on the method of observing longitudes at sea, for the solution of which important problem Philip III. had offered a considerable reward, an example which has since been followed in our own and other countries. Galileo had no sooner discovered Jupiter's satellites, than he recognized the use which might be made of them for that purpose, and devoted himself with peculiar assiduity to acquiring as perfect a knowledge as possible of their revolutions. The reader will easily understand how they were to be used, if their motion could be so well ascertained as to enable Galileo at Florence to predict the exact times at which any remarkable configurations would occur, as, for instance, the times at which any one of them would be eclipsed by Jupiter. A mariner who in the middle of the Atlantic should observe the same eclipse, and compare the time of night at which he made the observation (which he might know by setting his watch by the sun on the preceding day) with the time mentioned in the predictions, would, from the difference between the two, learn the difference between the hour at Florence and the hour at the place where the ship at that time happened to be. As the earth turns uniformly round through 360° of longitude in 24 hours, that is, through 15° in each hour, the hours, minutes, and seconds of time which express this difference must be multiplied by 15, and the respective products will give the degrees, minutes, and seconds of longitude, by which the ship was then distant from Florence. This statement is merely intended to give those who are unacquainted with astronomy, a general idea of the manner in which it was proposed to use these satellites. Our moon had already been occasionally employed in the same way, but the comparative frequency of the eclipses of Jupiter's moons, and the suddenness with which they disappear, gives a decided advantage to the new method. Both methods were embarrassed by the difficulty of observing the eclipses at sea. In addition to this, it was requisite, in both methods, that the sailors should be provided with accurate means of knowing the hour, wherever they might chance to be, which was far from being the case, for although (in order not to interrupt the explanation) we have above spoken of their *watches*, yet the watches and clocks of that day were not such as could be relied on sufficiently, during the interval which must necessarily occur between the two observations. This consideration led Galileo to reflect on the use which might be made of his pendulum for this purpose; and, with respect to the other difficulty, he contrived a peculiar kind of telescope, with which he flattered himself, somewhat prematurely, that it would be as easy to observe on ship-board as on shore.

During his stay at Rome, in 1615, and the following year, he disclosed some of these ideas to the Conte di Lemos, the viceroy of Naples, who had been president of the council of the Spanish Indies, and was fully aware of the importance of the matter. Galileo was in consequence invited to communicate directly with the Duke of Lerma, the Spanish minister, and instructions were accordingly sent by Cosmo, to the Conte Orso d'Elci, his ambassador at Madrid, to conduct the business there. Galileo entered warmly into the design, of which he had no other means of verifying the practicability; for as he says in one of his letters to Spain—"Your excellency may well believe that if this were an undertaking which I could conclude by myself, I would never have gone about begging favours from others; but in my study there are neither seas, nor Indies, nor islands, nor ports, nor shoals, nor ships, for which reason I am compelled to share the enterprise with great personages, and to fatigue myself to procure the acceptance of that, which ought with eagerness to be asked of me; but I console myself with the reflection that I am not singular in this, but that it commonly happens, with the exception of a little reputation, and that too often obscured and blackened by envy, that the least part of the advantage falls to the share of the inventors of things, which afterwards bring great gain, honours, and riches to others; so that I will never cease on my part to do every thing in my power, and I am ready to leave here all my comforts, my country, my friends, and family, and to cross over into Spain, to stay as long as I may be wanted in Seville, or Lisbon, or wherever it may be convenient, to implant the knowledge of this method, provided that due assistance and diligence be not wanting on the part of those who are to receive it, and who should solicit and foster it." But he could not, with all his enthusiasm, rouse the attention of the Spanish court. The negotiation languished, and although occasionally renewed during the next ten or twelve years, was never brought to a satisfactory issue. Some explanation of this otherwise unaccountable apathy of the Spanish court, with regard to the solution of a problem which they had certainly much at heart, is given in Nelli's life of Galileo; where it is asserted, on the authority of the Florentine records, that Cosmo required privately from Spain, (in return for the permission granted for Galileo to leave Florence, in pursuance of this design,) the privilege of sending every year from Leghorn two merchantmen, duty free, to the Spanish Indies.

CHAPTER XII.

Controversy on Comets—Saggiatore—Galileo's reception by Urban VIII—His family.

THE year 1618 was remarkable for the appearance of three comets, on which almost every astronomer in Europe found something to say and write. Galileo published some of his opinions with respect to them, through the medium of Mario Guiducci. This astronomer delivered a lecture before the Florentine academy, the heads of which he was supposed to have received from Galileo, who, during the whole time of the appearance of these comets, was confined to his bed by severe illness. This essay was printed in Florence *at the sign of The Medicean Stars.** What principally deserves notice in it, is the opinion of Galileo, that the distance of a comet cannot be safely determined by its parallax, from which we learn that he inclined to believe that comets are nothing but meteors occasionally appearing in the atmosphere, like rainbows, parhelia, and similar phenomena. He points out the difference in this respect between a fixed object, the distance of which may be calculated from the difference of direction in which two observers (at a known distance from each other) are obliged to turn themselves in order to see it, and meteors like the rainbow, which are simultaneously formed in different drops of water for each spectator, so that two observers in different places are in fact contemplating different objects. He then warns astronomers not to engage with too much warmth in a discussion on the distance of comets before they assure themselves to which of these two classes of phenomena they are to be referred. The remark is in itself perfectly just, although the opinion which occasioned it is now as certainly known to be erroneous, but it is questionable whether the observations which, up to that time, had been made upon comets, were sufficient, either in number or quality, to justify the censure which has been cast on Galileo for his opinion. The theory, moreover, is merely introduced as an hypothesis in Guiducci's essay. The same opinion was for a short time embraced by Cassini, a celebrated Italian astronomer, invited by Louis XIV. to the Observatory at Paris, when the science was considerably more advanced, and Newton, in his *Principia*, did not think it unworthy of him to show on what grounds it is untenable.

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* In Firenze nella Stamperia di Pietro Cecconcelli alle stelle Medicee, 1619.

Galileo was become the object of animosity in so many quarters that none of his published opinions, whether correct or incorrect, ever wanted a ready antagonist. The champion on the present occasion was again a Jesuit; his name was Oratio Grassi, who published *The Astronomical and Philosophical Balance*, under the disguised signature of Lotario Sarsi.

Galileo and his friends were anxious that his reply to Grassi should appear as quickly as possible, but his health had become so precarious and his frequent illnesses occasioned so many interruptions, that it was not until the autumn of 1623 that Il Saggiatore (or The Assayer) as he called his answer, was ready for publication. This was printed by the Lyncean Academy, and as Cardinal Maffeo Barberino, who had just been elected Pope, (with the title of Urban VIII.) had been closely connected with that society, and was also a personal friend of Cesi and of Galileo, it was thought a prudent precaution to dedicate the pamphlet to him. This essay enjoys a peculiar reputation among Galileo's works, not only for the matter contained in it, but also for the style in which it is written; insomuch that Andrès[*], when eulogizing Galileo as one of the earliest who adorned philosophical truths with the graces and ornaments of language, expressly instances the Saggiatore, which is also quoted by Frisi and Algarotti, as a perfect model of this sort of composition. In the latter particular, it is unsafe to interfere with the decisions of an Italian critic; but with respect to its substance, this famous composition scarcely appears to deserve its preeminent reputation. It is a prolix and rather tedious examination of Grassi's Essay; nor do the arguments seem so satisfactory, nor the reasonings so compact as is generally the case in Galileo's other writings. It does however, like all his other works, contain many very remarkable passages, and the celebrity of this production requires that we should extract one or two of the most characteristic.

The first, though a very short one, will serve to shew the tone which Galileo had taken with respect to the Copernican system since its condemnation at Rome, in 1616. "In conclusion, since the motion attributed to the earth, which I, as a pious and Catholic person, consider most false, and not to exist, accommodates itself so well to explain so many and such different phenomena, I shall not feel sure, unless Sarsi descends to more distinct considerations than those which he has yet produced, that, false as it is, it may not just as deludingly correspond with the phenomena of comets."

Sarsi had quoted a story from Suidas in support of his argument that motion always produces heat, how the Babylonians used to cook their eggs by whirling them in a sling; to which Galileo replies: "I cannot refrain from marvelling that Sarsi will persist in proving to me, by authorities, that which at any moment I can bring to the test of experiment. We examine witnesses in things which are doubtful, past, and not permanent, but not in those things which are done in our own presence. If discussing a difficult problem were like carrying a weight, since several horses will carry more sacks of corn than one alone will, I would agree that many reasoners avail more than one; but *discoursing* is like *coursing*, and not like carrying, and one barb by himself will run farther than a hundred Friesland horses. When Sarsi brings up such a multitude of authors, it does not seem to me that he in the least degree strengthens his own conclusions, but he ennobles the cause of Signor Mario and myself, by shewing that we reason better than many men of established reputation. If Sarsi insists that I believe, on Suidas' credit, that the Babylonians cooked eggs by swiftly whirling them in a sling, I will believe it; but I must needs say, that the cause of such an effect is very remote from that to which it is attributed, and to find the true cause I shall reason thus. If an effect does not follow with us which followed with others at another time, it is because, in our experiment, something is wanting which was the cause of the former success; and if only one thing is wanting to us, that one thing is the true cause. Now we have eggs, and slings, and strong men to whirl them, and yet they will not become cooked; nay, if they were hot at first, they more quickly become cold: and since nothing is wanting to us but to be Babylonians, it follows that being Babylonians is the true cause why the eggs became hard, and not the friction of the air, which is what I wished to prove.—Is it possible that in travelling post, Sarsi has never noticed what freshness is occasioned on the face by the continual change of air? and if he has felt it, will he rather trust the relation by others, of what was done two thousand years ago at Babylon, than what he can at this moment verify in his own person? I at least will not be so wilfully wrong, and so ungrateful to nature and to God, that having been gifted with sense and language, I should voluntarily set less value on such great endowments than on the fallacies of a fellow man, and blindly and blunderingly believe whatever I hear, and barter the freedom of my intellect for slavery to one as liable to error as myself."

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[*] Dell' Origine d'ogni Literatura: Parma, 1787.

Our final extract shall exhibit a sample of Galileo's metaphysics, in which may be observed the germ of a theory very closely allied to that which was afterwards developed by Locke and Berkeley.—"I have now only to fulfil my promise of declaring my opinions on the proposition that motion is the cause of heat, and to explain in what manner it appears to me that it may be true. But I must first make some remarks on that which we call heat, since I strongly suspect that a notion of it prevails which is very remote from the truth; for it is believed that there is a true accident, affection, and quality, really inherent in the substance by which we feel ourselves heated. This much I have to say, that so soon as I conceive a material or corporeal substance, I simultaneously feel the necessity of conceiving that it has its boundaries, and is of some shape or other; that, relatively to others, it is great or small; that it is in this or that place, in this or that time; that it is in motion, or at rest; that it touches, or does not touch another body; that it is unique, rare, or common; nor can I, by any act of the imagination, disjoin it from these qualities: but I do not find myself absolutely compelled to apprehend it as necessarily accompanied by such conditions, as that it must be white or red, bitter or sweet, sonorous or silent, smelling sweetly or disagreeably; and if the senses had not pointed out these qualities, it is probable that language and imagination alone could never have arrived at them. Because, I am inclined to think that these tastes, smells, colours, &c., with regard to the subject in which they appear to reside, are nothing more than mere names, and exist only in the sensitive body; insomuch that, when the living creature is removed, all these qualities are carried off and annihilated; although we have imposed particular names upon them, and different from those of the other first and real accidents, and would fain persuade ourselves that they are truly and in fact distinct. But I do not believe that there exists any thing in external bodies for exciting tastes, smells, and sounds, but size, shape, quantity, and motion, swift or slow; and if ears, tongues, and noses were removed, I am of opinion that shape, number, and motion would remain, but there would be an end of smells, tastes, and sounds, which, abstractedly from the living creature, I take to be mere words."

In the spring following the publication of the "Saggiatore," that is to say, about the time of Easter, in 1624, Galileo went a third time to Rome to compliment Urban on his elevation to the pontifical chair. He was obliged to make this journey in a litter; and it appears from his letters that for some years he had been seldom able to bear any other mode of conveyance. In such a state of health it seems unlikely that he would have quitted home on a mere visit of ceremony, which suspicion is strengthened by the beginning of a letter from him to Prince Cesi, dated in October, 1623, in which he says: "I have received the very courteous and prudent advice of your excellency about the time and manner of my going to Rome, and shall act upon it; and I will visit you at Acqua Sparta, that I may be completely informed of the actual state of things at Rome." However this may be, nothing could be more gratifying than his public reception there. His stay in Rome did not exceed two months, (from the beginning of April till June,) and during that time he was admitted to six long and satisfactory interviews with the Pope, and on his departure received the promise of a pension for his son Vincenzo, and was himself presented with "a fine painting, two medals, one of gold and the other of silver, and a good quantity of agnus dei." He had also much communication with several of the cardinals, one of whom, Cardinal Hohenzoller, told him that he had represented to the pope on the subject of Copernicus, that "all the heretics were of that opinion, and considered it as undoubted; and that it would be necessary to be very circumspect in coming to any resolution: to which his holiness replied, that the church had not condemned it, nor was it to be condemned as heretical, but only as rash; adding, that there was no fear of any one undertaking to prove that it must necessarily be true." Urban also addressed a letter to Ferdinand, who had succeeded his father Cosmo as Grand Duke of Tuscany, expressly for the purpose of recommending Galileo to him. "For We find in him not only literary distinction, but also the love of piety, and he is strong in those qualities by which pontifical good-will is easily obtained. And now, when he has been brought to this city to congratulate Us on Our elevation, We have very lovingly embraced him;—nor can We suffer him to return to the country whither your liberality recalls him without an ample provision of pontifical love. And that you may know how dear he is to Us, We have willed to give him this honourable testimonial of virtue and piety. And We further signify that every benefit which you shall confer upon him, imitating, or even surpassing your father's liberality, will conduce to Our gratification." Honoured with these unequivocal marks of approbation, Galileo returned to Florence.

His son Vincenzo is soon afterwards spoken of as being at Rome; and it is not improbable that Galileo sent him thither on the appointment of his friend and pupil, the Abbé Castelli, to be mathematician to the pope. Vincenzo had been legitimated by an edict of Cosmo in 1619, and, according to Nelli, married, in 1624, Sestilia, the daughter of Carlo Bocchineri. There are no traces to be found of Vincenzo's mother after 1610, and perhaps she died about that time. Galileo's family by her consisted of Vincenzo and two daughters, Julia and Polissena, who both took the veil in the convent of Saint Matthew at Arcetri, under the names of Sister Arcangiola and Sister Maria Celeste. The latter is said to have possessed extraordinary talents. The date of Vincenzo's marriage, as given by Nelli, appears somewhat inconsistent with the correspondence between Galileo and Castelli, in which, so late as 1629, Galileo is apparently writing of his son as a student under Castelli's superintendence, and intimates the amount of pocket-money he can afford to allow him, which he fixes at three crowns a month; adding, that "he ought to be contented with as many crowns, as, at his age, I possessed groats." Castelli had given but an unfavourable account of Vincenzo's conduct, characterizing him as "dissolute, obstinate, and impudent;" in consequence of which behaviour, Galileo seems to have thought that the pension of sixty crowns, which had been granted by the pope, might be turned to better account than by employing it on his son's education; and accordingly in his reply he requested Castelli to dispose of it, observing that the proceeds would be useful in assisting him to discharge a great load of debt with which he found himself saddled on account of his brother's family. Besides this pension, another of one hundred crowns was in a few years granted by Urban to Galileo himself, but it appears to have been very irregularly paid, if at all.

About the same time Galileo found himself menaced either with the deprivation of his stipend as extraordinary professor at Pisa, or with the loss of that leisure which, on his removal to Florence, he had been so anxious to secure. In 1629, the question was agitated by the party opposed to him, whether it were in the power of the grand duke to assign a pension out of the funds of the University, arising out of ecclesiastical dues, to one who neither lectured nor resided there. This scruple had slept during nineteen years which had elapsed since Galileo's establishment in Florence, but probably those who now raised it reckoned upon finding in Ferdinand II., then scarcely of age, a less firm supporter of Galileo than his father Cosmo had been. But the matter did not proceed so far; for, after full deliberation, the prevalent opinion of the theologians and jurists who were consulted appeared to be in favour of this exercise of prerogative, and accordingly Galileo retained his stipend and privileges.

CHAPTER XIII.

Publication of Galileo's 'System of the World'—His Condemnation and Abjuration.

IN the year 1630, Galileo brought to its conclusion his great work, "The Dialogue on the Ptolemaic and Copernican Systems," and began to take the necessary steps for procuring permission to print it. This was to be obtained in the first instance from an officer at Rome, entitled the master of the sacred palace; and after a little negotiation Galileo found it would be necessary for him again to return thither, as his enemies were still busy in thwarting his views and wishes. Niccolo Riccardi, who at that time filled the office of master of the palace, had been a pupil of Galileo, and was well disposed to facilitate his plans; he pointed out, however, some expressions in the work which he thought it necessary to erase, and, with the understanding that this should be done, he returned the manuscript to Galileo with his subscribed approbation. The unhealthy season was drawing near, and Galileo, unwilling to face it, returned home, where he intended to complete the index and dedication, and then to send it back to Rome to be printed in that city, under the superintendence of Federigo Cesi. This plan was disconcerted by the premature death of that accomplished nobleman, in August 1630, in whom Galileo lost one of his steadiest and most effective friends and protectors. This unfortunate event determined Galileo to attempt to procure permission to print his book at Florence. A contagious disorder had broken out in Tuscany with such severity as almost to interrupt all communication between Florence and Rome, and this was urged by Galileo as an additional reason for granting his request. Riccardi at first seemed inclined to insist that the book should be sent to him a second time, but at last contented himself with inspecting the commencement and conclusion, and consented that (on its receiving also a license from the inquisitor-general at Florence, and from one or two others whose names appear on the title-page) it might be printed where Galileo wished.

These protracted negotiations prevented the publication of the work till late in 1632; it then appeared, with a dedication to Ferdinand, under the following title:—"A Dialogue, by Galileo Galilei, Extraordinary Mathematician of the University of Pisa, and Principal Philosopher and Mathematician of the Most Serene Grand Duke of Tuscany; in which, in a conversation of four days, are discussed the two principal Systems of the World, the Ptolemaic and Copernican, indeterminately proposing the Philosophical Arguments as well on one side as on the other." The beginning of the introduction, which is addressed "To the discreet Reader," is much too characteristic to be passed by without notice.—"Some years ago, a salutary edict was promulgated at Rome, which, in order to obviate the perilous scandals of the present age, enjoined an opportune silence on the Pythagorean opinion of the earth's motion. Some were not wanting, who rashly asserted that this decree originated, not in a judicious examination, but in ill informed passion; and complaints were heard that counsellors totally inexperienced in astronomical observations ought not by hasty prohibitions to clip the wings of speculative minds. My zeal could not keep silence when I heard these rash lamentations, and I thought it proper, as being fully informed with regard to that most prudent determination, to appear publicly on the theatre of the world as a witness of the actual truth. I happened at that time to be in Rome: I was admitted to the audiences, and enjoyed the approbation of the most eminent prelates of that court, nor did the publication of that decree occur without my receiving some prior intimation of it.[*] Wherefore it is my intention in this present work, to show to foreign nations that as much is known of this matter in Italy, and particularly in Rome, as ultramontane diligence can ever have formed any notion of, and collecting together all my own speculations on the Copernican system, to give them to understand that the knowledge of all these preceded the Roman censures, and that from this country proceed not only dogmas for the salvation of the soul, but also ingenious discoveries for the gratification of the understanding. With this object, I have taken up in the Dialogue the Copernican side of the question, treating it as a pure mathematical hypothesis; and endeavouring in every artificial manner to represent it as having the advantage, not over the opinion of the stability of the earth absolutely, but according to the manner in which that opinion is defended by some, who indeed profess to be Peripatetics, but retain only the name, and are contented without improvement to worship shadows, not philosophizing with their own reason, but only from the recollection of four principles imperfectly understood." —This very flimsy veil could scarcely blind any one as to Galileo's real views in composing this work, nor does it seem probable that he framed it with any expectation of appearing neutral in the discussion. It is more likely that he flattered himself that, under the new government at Rome, he was not likely to be molested on account of the personal prohibition which he had received in 1616, "not to believe or teach the motion of the earth in any manner," provided he kept himself within the letter of the limits of the more public and general order, that the Copernican system was not to be brought forward otherwise than as a mere mathematically convenient, but in fact unreal supposition. So long as this decree remained in force, a due regard to consistency would compel the Roman Inquisitors to notice an unequivocal violation of it; and this is probably what Urban had implied in the remark quoted by Hohenzoller to Galileo.* There were not wanting circumstances which might compensate for the loss of Cosmo and of Federigo Cesi; Cosmo had been succeeded by his son, who, though he had not yet attained his father's energy, showed himself as friendly as possible to Galileo. Cardinal Bellarmine, who had been mainly instrumental in procuring the decree of 1616, was dead; Urban on the contrary, who had been among the few Cardinals who then opposed it as uncalled for and ill-advised, was now possessed of supreme power, and his recent affability seemed to prove that the increased difference in their stations had not caused him to forget their early and long-continued intimacy. It is probable that Galileo would not have found himself mistaken in this estimate of his position, but for an unlucky circumstance, of which his enemies immediately saw the importance, and which they were not slow in making available against him. The dialogue of Galileo's work is conducted between three personages;—Salviati and Sagredo, who were two noblemen, friends of Galileo, and Simplicio, a name borrowed from a noted commentator upon Aristotle, who wrote in the sixth century. Salviati is the principal philosopher of the work; it is to him that the others apply for solutions of their doubts and difficulties, and on him the principal task falls of explaining the tenets of the Copernican theory. Sagredo is only a half convert, but an acute and ingenious one; to him are allotted the objections which seem to have some real difficulty in them, as well as lively illustrations and digressions, which might have been thought inconsistent with the gravity of Salviati's character. Simplicio, though candid and modest, is of course a confirmed Ptolemaist and Aristotelian, and is made to produce successively all the popular arguments of that school in support of his master's system. Placed between the wit and the philosopher, it may be guessed that his success is very indifferent, and in fact he is alternately ridiculed and confuted at every turn. As Galileo racked his memory and invention to leave unanswered no argument which was or could be advanced against Copernicus, it unfortunately happened, that he introduced some which Urban himself had urged upon him in their former controversies on this subject; and Galileo's opponents found means to make His Holiness believe that the character of Simplicio had been sketched in personal derision of him. We do not think it necessary to exonerate Galileo from this charge; the obvious folly of such an useless piece of ingratitude speaks sufficiently for itself. But self-love is easily irritated; and Urban, who aspired to a reputation for literature and science, was peculiarly sensitive on this point. His own expressions almost prove his belief that such had been Galileo's design, and it seems to explain the otherwise inexplicable change which took place in his conduct towards his old friend, on account of a book which he had himself undertaken to examine, and of which he had authorised the publication.

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[*] Delambre quotes this sentence from a passage which is so obviously ironical throughout, as an instance of Galileo's mis-statement of facts!—*Hist. de l'Astr. Mod.*, vol. i. p. 666.

One of the earliest notices of what was approaching, is found in the dispatches, dated August 24, 1632, from Ferdinand's minister, Andrea Cioli, to Francesco Nicolini, the Tuscan ambassador at the court of Rome.

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* Page 54.

"I have orders to signify to Your Excellency that His Highness remains greatly astonished that a book, placed by the author himself in the hands of the supreme authority in Rome, read and read again there most attentively, and in which every thing, not only with the consent, but at the request of the author, was amended, altered, added, or removed at the will of his superiors, which was again subjected here to the same examination, agreeably to orders from Rome, and which finally was licensed both there and here, and here printed and published, should now become an object of suspicion at the end of two years, and the author and printer be prohibited from publishing any more." —In the sequel is intimated Ferdinand's desire that the charges, of whatever nature they might be, either against Galileo or his book, might be reduced to writing and forwarded to Florence, that he might prepare for his justification; but this reasonable demand was utterly disregarded. It appears to have been owing to the mean subserviency of Cioli to the court of Rome, that Ferdinand refrained from interfering more strenuously to protect Galileo. Cioli's words are: "The Grand Duke is so enraged with this business of Galileo, that I do not know what will be done. I know, at least, that His Holiness shall have no reason to complain of his ministers, or of their bad advice."*

A letter from Galileo's Venetian friend Micanzio, dated about a month later, is in rather a bolder and less formal style: — "The efforts of your enemies to get your book prohibited will occasion no loss either to your reputation, or to the intelligent part of the world. As to posterity, this is just one of the surest ways to hand the book down to them. But what a wretched set this must be to whom every good thing, and all that is founded in nature, necessarily appears hostile and odious! The world is not restricted to a single corner; you will see the book printed in more places and languages than one; and just for this reason, I wish they would prohibit all good books. My disgust arises from seeing myself deprived of what I most desire of this sort, I mean your other dialogues; and if, from this cause, I fail in having the pleasure of seeing them, I shall devote to a hundred thousand devils these unnatural and godless hypocrites."

At the same time, Thomas Campanella, a monk, who had already distinguished himself by an apology for Galileo (published in 1622), wrote to him from Rome:—"I learn with the greatest disgust, that a congregation of angry theologians is forming to condemn your Dialogues, and that no single member of it has any knowledge of mathematics, or familiarity with abstruse speculations. I should advise you to procure a request from the Grand Duke that, among the Dominicans and Jesuits and Theatins, and secular priests whom they are putting on this congregation against your book, they should admit also Castelli and myself." It appears, from subsequent letters both from Campanella and Castelli, that the required letter was procured and sent to Rome, but it was not thought prudent to irritate the opposite party by a request which it was then clearly seen would have been made in vain. Not only were these friends of Galileo not admitted to the congregation, but, upon some pretext, Castelli was even sent away from Rome, as if Galileo's enemies desired to have as few enlightened witnesses as possible of their proceedings; and on the contrary, Scipio Chiaramonte, who had been long known for one of the staunchest and most bigoted defenders of the old system, and who, as Montucla says, seems to have spent a long life in nothing but retarding, as far as he was able, the progress of discovery, was summoned from Pisa to complete their number. From this period we have a tolerably continuous account of the proceedings against Galileo in the dispatches which Nicolini sent regularly to his court. It appears from them that Nicolini had several interviews with the Pope, whom he found highly incensed against Galileo, and in one of the earliest he received an intimation to advise the Duke "not to engage himself in this matter as he had done in the other business of Alidosi,* because he would not get through it with honour." Finding Urban in this humour, Nicolini thought it best to temporize, and to avoid the appearance of any thing like direct opposition. On the 15th of September, probably as soon as the first report on

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* Galuzzi, Storia di Toscana. Firenze, 1822.

* Alidosi was a Florentine nobleman, whose estate Urban wished to confiscate on a charge of heresy.—*Galuzzi.*

Galileo's book had been made, Nicolini received a private notice from the Pope, "in especial token of the esteem in which he held the Grand Duke," that he was unable to do less than consign the work to the consideration of the Inquisition. Nicolini was permitted to communicate this to the Grand Duke only, and both were declared liable to "the usual censures" of the Inquisition in case of divulging the secret.

The next step was to summon Galileo to Rome, and the only answer returned to all Nicolini's representations of his advanced age of seventy years, the very infirm state of his health, and the discomforts which he must necessarily suffer in such a journey, and in keeping quarantine, was that he might come at leisure, and that the quarantine should be relaxed as much as possible in his favour, but that it was indispensably necessary that he should be personally examined before the Inquisition at Rome. Accordingly, on the 14th of February, 1633, Nicolini announces Galileo's arrival, and that he had officially notified his presence to the Assessor and Commissary of the Holy Office. Cardinal Barberino, Urban's nephew, who seems on the whole to have acted a friendly part towards Galileo, intimated to him that his most prudent course would be to keep himself as much at home and as quiet as possible, and to refuse to see any but his most intimate friends. With this advice, which was repeated to him from several quarters, Galileo thought it best to comply, and kept himself entirely secluded in Nicolini's palace, where he was as usual maintained at the expense of the Grand Duke. Nelli quotes two letters, which passed between Ferdinand's minister Cioli and Nicolini, in which the former intimated that Galileo's expenses were to be defrayed only during the first month of his residence at Rome. Nicolini returned a spirited answer, that in that case, after the time specified, he should continue to treat him as before at his own private cost.

The permission to reside at the ambassador's palace whilst his cause was pending, was granted and received as an extraordinary indulgence on the part of the Inquisition, and indeed if we estimate the proceedings throughout against Galileo by the usual practice of that detestable tribunal, it will appear that he was treated with unusual consideration. Even when it became necessary in the course of the inquiry to examine him in person, which was in the beginning of April, although his removal to the Holy Office was then insisted upon, yet he was not committed to close or strictly solitary confinement. On the contrary, he was honourably lodged in the apartments of the Fiscal of the Inquisition, where he was allowed the attendance of his own servant, who was also permitted to sleep in an adjoining room, and to come and go at pleasure. His table was still furnished by Nicolini. But, notwithstanding the distinction with which he was thus treated, Galileo was annoyed and uneasy at being (though little more than nominally) within the walls of the Inquisition. He became exceedingly anxious that the matter should be brought to a conclusion, and a severe attack of his constitutional complaints rendered him still more fretful and impatient. On the last day of April, about ten days after his first examination, he was unexpectedly permitted to return to Nicolini's house, although the proceedings were yet far from being brought to a conclusion. Nicolini attributes this favour to Cardinal Barberino, who, he says, liberated Galileo on his own responsibility, in consideration of the enfeebled state of his health.

In the society of Nicolini and his family, Galileo recovered something of his courage and ordinary cheerfulness, although his return appears to have been permitted on express condition of a strict seclusion; for at the latter end of May, Nicolini was obliged to apply for permission that Galileo should take that exercise in the open air which was necessary for his health; on which occasion he was permitted to go into the public gardens in a half-closed carriage.

On the evening of the 20th of June, rather more than four months after Galileo's arrival in Rome, he was again summoned to the Holy Office, whither he went the following morning; he was detained there during the whole of that day, and on the next day was conducted in a penitential dress * to the Convent of Minerva, where the Cardinals and Prelates, his judges, were assembled for the purpose of passing judgment upon him, by which this venerable old man was solemnly called upon to renounce and abjure, as impious and heretical, the opinions which his whole existence had been consecrated to form and strengthen.

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* S' irrito il Papa, e lo fece abjurare, comparendo il pover uomo con uno straccio di camicia indosso, che faceva compassione, MS. nella Bibl. Magliab. Venturi.

As we are not aware that this remarkable record of intolerance and bigoted folly has ever been printed entire in English, we subjoin a literal translation of the whole sentence and abjuration.

The Sentence of the Inquisition on Galileo.

"We, the undersigned, by the Grace of God, Cardinals of the Holy Roman Church, Inquisitors General throughout the whole Christian Republic, Special Deputies of the Holy Apostolical Chair against heretical depravity,

"Whereas you, Galileo, son of the late Vincenzo Galilei of Florence, aged seventy years, were denounced in 1615 to this Holy Office, for holding as true a false doctrine taught by many, namely, that the sun is immoveable in the centre of the world, and that the earth moves, and also with a diurnal motion; also, for having pupils whom you instructed in the same opinions; also, for maintaining a correspondence on the same with some German mathematicians; also for publishing certain letters on the solar spots, in which you developed the same doctrine as true; also, for answering the objections which were continually produced from the Holy Scriptures, by glozing the said Scriptures according to your own meaning; and whereas thereupon was produced the copy of a writing, in form of a letter, professedly written by you to a person formerly your pupil, in which, following the hypotheses of Copernicus, you include several propositions contrary to the true sense and authority of the Holy Scripture: therefore this holy tribunal being desirous of providing against the disorder and mischief which was thence proceeding and increasing to the detriment of the holy faith, by the desire of His Holiness, and of the Most Eminent Lords Cardinals of this supreme and universal Inquisition, the two propositions of the stability of the sun, and motion of the earth, were *qualified* by the *Theological Qualifiers* as follows:

"1*st. The proposition that the Sun is in the centre of the world and immoveable from its place, is absurd, philosophically false, and formally heretical; because it is expressly contrary to the Holy Scripture.*

"2*dly. The proposition that the Earth is not the centre of the world, nor immoveable, but that it moves, and also with a diurnal motion, is also absurd, philosophically false, and, theologically considered, at least erroneous in faith.*

"But whereas being pleased at that time to deal mildly with you, it was decreed in the Holy Congregation, held before His Holiness on the 25th day of February, 1616, that His Eminence the Lord Cardinal Bellarmine should enjoin you to give up altogether the said false doctrine; if you should refuse, that you should be ordered by the Commissary of the Holy Office to relinquish it, not to teach it to others, nor to defend it, nor ever mention it, and in default of acquiescence that you should be imprisoned; and in execution of this decree, on the following day at the palace, in presence of His Eminence the said Lord Cardinal Bellarmine, after you had been mildly admonished by the said Lord Cardinal, you were commanded by the acting Commissary of the Holy Office, before a notary and witnesses, to relinquish altogether the said false opinion, and in future neither to defend nor teach it in any manner, neither verbally nor in writing, and upon your promising obedience you were dismissed.

"And in order that so pernicious a doctrine might be altogether rooted out, nor insinuate itself farther to the heavy detriment of the Catholic truth, a decree emanated from the Holy Congregation of the Index* prohibiting the books which treat of this doctrine; and it was declared false, and altogether contrary to the Holy and Divine Scripture.

"And whereas a book has since appeared, published at Florence last year, the title of which shewed that you were the author, which title is: *The Dialogue of Galileo Galilei, on the two principal systems of the world, the Ptolemaic and Copernican;* and whereas the Holy Congregation has heard that, in consequence of the printing of the said book, the false opinion of the earth's motion and stability of the sun is daily gaining ground; the said book has been taken into careful consideration, and in it has been detected a glaring violation of the said order, which had been intimated to you; inasmuch as in this book you have defended the said opinion, already and in your presence condemned; although in the said book you labour with many circumlocutions to induce the belief that it is left by you undecided, and in express terms probable: which is equally a very grave error, since an opinion can in no way be probable which has been already declared and finally determined contrary to the divine Scripture. Therefore by Our order you have been cited to this Holy Office, where, on your examination upon oath, you have acknowledged the said book as written and printed by you. You also confessed that you began to write the said book ten or twelve years ago, after the order aforesaid had been given. Also, that you demanded license to publish it, but without signifying to those who granted you this permission that you had been commanded not to hold, defend, or teach the said doctrine in any manner. You also confessed that the style of the said book was, in many places, so composed that the reader might think the arguments adduced on the false side to be so worded as more effectually to entangle the understanding than to be easily solved, alleging in excuse, that you have thus run into an error, foreign (as you say) to your intention, from writing in the form of a dialogue, and in consequence of the natural complacency which every one feels with regard to his own subtilties, and in showing himself more skilful than the generality of mankind in contriving, even in favour of false propositions, ingenious and apparently probable arguments.

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* The Index is a list of books, the reading of which is prohibited to Roman Catholics. This list, in the early periods of the Reformation, was often consulted by the curious, who were enlarging their libraries; and a story is current in England, that, to prevent this mischief, the Index itself was inserted in its own forbidden catalogue. The origin of this story is, that an Index was published in Spain, particularizing the objectionable passages in such books as were only partially condemned: and although compiled with the best intentions, this was found to be so racy, that it became necessary to forbid the circulation of this edition in subsequent lists.

"And, upon a convenient time being given to you for making your defence, you produced a certificate in the handwriting of His Eminence the Lord Cardinal Bellarmine, procured, as you said, by yourself, that you might defend yourself against the calumnies of your enemies, who reported that you had abjured your opinions, and had been punished by the Holy Office; in which certificate it is declared, that you had not abjured, nor had been punished, but merely that the declaration made by His Holiness, and promulgated by the Holy Congregation of the Index, had been announced to you, which declares that the opinion of the motion of the earth, and stability of the sun, is contrary to the Holy Scriptures, and, therefore, cannot be held or defended. Wherefore, since no mention is there made of two articles of the order, to wit, the order 'not to teach,' and 'in any manner,' you argued that we ought to believe that, in the lapse of fourteen or sixteen years, they had escaped your memory, and that this was also the reason why you were silent as to the order, when you sought permission to publish your book, and that this is said by you not to excuse your error, but that it may be attributed to vain-glorious ambition, rather than to malice. But this very certificate, produced on your behalf, has greatly aggravated your offence, since it is therein declared that the said opinion is contrary to the Holy Scripture, and yet you have dared to treat of it, to defend it, and to argue that it is probable; nor is there any extenuation in the licence artfully and cunningly extorted by you, since you did not intimate the command imposed upon you. But whereas it appeared to Us that you had not disclosed the whole truth with regard to your intentions, We thought it necessary to proceed to the rigorous examination of you, in which (without any prejudice to what you had confessed, and which is above detailed against you, with regard to your said intention) you answered like a good Catholic.

"Therefore, having seen and maturely considered the merits of your cause, with your said confessions and excuses, and every thing else which ought to be seen and considered, We have come to the underwritten final sentence against you.

"Invoking, therefore, the most holy name of Our Lord Jesus Christ, and of His Most Glorious Virgin Mother Mary, by this Our final sentence, which, sitting in council and judgment for the tribunal of the Reverend Masters of Sacred Theology, and Doctors of both Laws, Our Assessors, We put forth in this writing touching the matters and controversies before Us, between The Magnificent Charles Sincerus, Doctor of both Laws, Fiscal Proctor of this Holy Office of the one part, and you, Galileo Galilei, an examined and confessed criminal from this present writing now in progress as above of the other part, We pronounce, judge, and declare, that you, the said Galileo, by reason of these things which have been detailed in the course of this writing, and which, as above, you have confessed, have rendered yourself vehemently suspected by this Holy Office of heresy: that is to say, that you believe and hold the false doctrine, and contrary to the Holy and Divine Scriptures, namely, that the sun is the centre of the world, and that it does not move from east to west, and that the earth does move, and is not the centre of the world; also that an opinion can be held and supported as probable after it has been declared and finally decreed contrary to the Holy Scripture, and consequently that you have incurred all the censures and penalties enjoined and promulgated in the sacred canons, and other general and particular constitutions against delinquents of this description. From which it is Our pleasure that you be absolved, provided that, first, with a sincere heart and unfeigned faith, in Our presence, you abjure, curse, and detest the said errors and heresies, and every other error and heresy contrary to the Catholic and Apostolic Church of Rome, in the form now shown to you.

"But, that your grievous and pernicious error and transgression may not go altogether unpunished, and that you may be made more cautious in future, and may be a warning to others to abstain from delinquencies of this sort, We decree that the book of the dialogues of Galileo Galilei be prohibited by a public edict, and We condemn you to the formal prison of this Holy Office for a period determinable at Our pleasure; and, by way of salutary penance, We order you, during the next three years, to recite once a week the seven penitential psalms, reserving to Ourselves the power of moderating, commuting, or taking off the whole or part of the said punishment and penance.

"And so We say, pronounce, and by Our sentence declare, decree, and reserve, in this and in every other better form and manner, which lawfully We may and can use.

"So We, the subscribing Cardinals, pronounce.

Felix, Cardinal di Ascoli,
Guido, Cardinal Bentivoglio,
Desiderio, Cardinal di Cremona,
Antonio, Cardinal S. Onofrio,
Berlingero, Cardinal Gessi,
Fabricio, Cardinal Verospi,
Martino, Cardinal Ginetti."

We cannot suppose that Galileo, even broken down as he was with age and infirmities, and overawed by the merciless tribunal to whose power he was subjected, could without extreme reluctance thus formally give the lie to his whole life, and call upon God to witness his renunciation of the opinions which even his bigoted judges must have felt that he still clung to in his heart.

We know indeed that his friends were unanimous in recommending an unqualified acquiescence in whatever might be required, but some persons have not been able to find an adequate explanation of his submission, either in their exhortations, or in the mere dread of the alternative which might await him in case of non-compliance. It has in short been supposed, although the suspicion scarcely rests upon grounds sufficiently strong to warrant the assertion, that Galileo did not submit to this abjuration until forced to it, not merely by the apprehension, but by the actual experience of personal violence. The arguments on which this horrible idea appears to be mainly founded are the two following: First, the Inquisitors declare in their sentence that, not satisfied with Galileo's first confession, they judged it necessary to proceed "to the rigorous examination of him, in which he answered like a good Catholic.[*]" It is pretended by those who are more familiar with inquisitorial language than we can profess to be, that the words *il rigoroso esame*, form the official phrase for the application of the torture, and accordingly they interpret this passage to mean, that the desired answers and submission had thus been extorted from Galileo, which his judges had otherwise failed to get from him. And, secondly, the partisans of this opinion bring forward in corroboration of it, that Galileo immediately on his departure from Rome, in addition to his old complaints, was found to be afflicted with hernia, and this was a common consequence of the torture of the cord, which they suppose to have been inflicted. It is right to mention that no other trace can be found of this supposed torturing in all the documents relative to the proceedings against Galileo, at least Venturi was so assured by one who had inspected the originals at Paris.[†]

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[*] Giudicassimo esser necessario venir contro di te al rigoroso esame nel quale rispondesti cattolicamente.

[†] The fate of these documents is curious; after being long preserved at Rome, they were carried away in 1809, by order of Buonaparte, to Paris, where they remained till his first abdication. Just before the hundred days, the late king of France, wishing to inspect them, ordered that they should be brought to his own apartments for that purpose. In the hasty flight which soon afterwards followed, the manuscripts were forgotten, and it is not known what became of them. A French translation, begun by Napoleon's desire, was completed only down to the 30th of April, 1633, the date of Galileo's first return to Nicolini's palace.

Although the arguments we have mentioned appear to us slight, yet neither can we attach much importance to the contrast which the favourers of the opposite opinion profess to consider so incredible between the honourable manner in which Galileo was treated throughout the rest of the inquiry, and the suspected harsh proceeding against him. Whether Galileo should be lodged in a prison or a palace, was a matter of far other importance to the Inquisitors and to their hold upon public opinion, than the question whether or not he should be suffered to exhibit a persevering resistance to the censures which they were prepared to cast upon him. Nor need we shrink from the idea, as we might from suspecting of some gross crime, on trivial grounds, one of hitherto unblemished innocence and character. The question may be disencumbered of all such scruples, since one atrocity more or less can do little towards affecting our judgment of the unholy Office of the Inquisition.

Delambre, who could find so much to reprehend in Galileo's former uncompromising boldness, is deeply penetrated with the insincerity of his behaviour on the present occasion. He seems to have forgotten that a tribunal which finds it convenient to carry on its inquiries in secret, is always liable to the suspicion of putting words into the mouth of its victims; and if it were worth while, there is sufficient internal evidence that the language which Galileo is made to hold in his defence and confession, is rather to be read as the composition of his judges than his own. For instance, in one of the letters which we have extracted*, it may be seen that this obnoxious work was already in forward preparation as early as 1610, and yet he is made to confess, and the circumstance appears to be brought forward in aggravation of his guilt, that he began to write it after the prohibition which he had received in 1616.

The abjuration was drawn up in the following terms:—

The Abjuration of Galileo.

"I Galileo Galilei, son of the late Vincenzo Galilei, of Florence, aged 70 years, being brought personally to judgment, and kneeling before you, Most Eminent and Most Reverend Lords Cardinals, General Inquisitors of the universal Christian republic against heretical depravity, having before my eyes the Holy Gospels, which I touch with my own hands, swear, that I have always believed, and now believe, and with the help of God will in future believe, every article which the Holy Catholic and Apostolic Church of Rome holds, teaches, and preaches. But because I had been enjoined by this Holy Office altogether to abandon the false opinion which maintains that the sun is the centre and immoveable, and forbidden to hold, defend, or teach, the said false doctrine in any manner, and after it had been signified to me that the said doctrine is repugnant with the Holy Scripture, I have written and printed a book, in which I treat of the same doctrine now condemned, and adduce reasons with great force in support of the same, without giving any solution, and therefore have been judged grievously suspected of heresy; that is to say, that I held and believed that the sun is the centre of the world and immoveable, and that the earth is not the centre and moveable. Willing, therefore, to remove from the minds of Your Eminences, and of every Catholic Christian, this vehement suspicion rightfully entertained towards me, with a sincere heart and unfeigned faith, I abjure, curse, and detest, the said errors and heresies, and generally every other error and sect contrary to the said Holy Church; and I swear, that I will never more in future say or assert anything verbally, or in writing, which may give rise to a similar suspicion of me: but if I shall know any heretic, or any one suspected of heresy, that I will denounce him to this Holy Office, or to the Inquisitor and Ordinary of the place in which I may be. I swear, moreover, and promise, that I will fulfil, and observe fully, all the penances which have been, or shall be laid on me by this Holy Office. But if it shall happen that I violate any of my said promises, oaths, and protestations, (which God avert!) I subject myself to all the pains and punishments, which have been decreed and promulgated by the sacred canons, and other general and particular constitutions, against delinquents of this description. So may God help me, and his Holy Gospels, which I touch with my own hands. I, the above-named Galileo Galilei, have abjured, sworn, promised, and bound myself, as above, and in witness thereof with my own hand have subscribed this present writing of my abjuration, which

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* Page 18.

I have recited word for word. At Rome in the Convent of Minerva, 22d June, 1633. I, Galileo Galilei, have abjured as above with my own hand."

It is said that Galileo, as he rose from his knees, stamped on the ground, and whispered to one of his friends, *E pur si muove*—(It does move though).

Copies of Galileo's sentence and abjuration were immediately promulgated in every direction, and the professors at several universities received directions to read them publicly. At Florence this ceremony took place in the church of Sta. Croce, whither Guiducci, Aggiunti, and all others who were known in that city as firm adherents to Galileo's opinions, were specially summoned. The triumph of the "Paper Philosophers" was so far complete, and the alarm occasioned by this proof of their dying power extended even beyond Italy. "I have been told," writes Descartes from Holland to Mersenne at Paris, "that Galileo's system was printed in Italy last year, but that every copy has been burnt at Rome, and himself condemned to some sort of penance, which has astonished me so much that I have almost determined to burn all my papers, or at least never to let them be seen by any one. I cannot collect that he, who is an Italian and even a friend of the Pope, as I understand, has been criminated on any other account than for having attempted to establish the motion of the earth. I know that this opinion was formerly censured by some Cardinals, but I thought I had since heard, that no objection was now made to its being publicly taught, even at Rome."

The sentiments of all who felt themselves secured against the apprehension of personal danger could take but one direction, for, as Pascal well expressed it in one of his celebrated letters to the Jesuits—"It is in vain that you have procured against Galileo a decree from Rome condemning his opinion of the earth's motion. Assuredly, that will never prove it to be at rest; and if we have unerring observations proving that it turns round, not all mankind together can keep it from turning, nor themselves from turning with it."

The assembly of doctors of the Sorbonne at Paris narrowly escaped from passing a similar sentence upon the system of Copernicus. The question was laid before them by Richelieu, and it appears that their opinion was for a moment in favour of confirming the Roman decree. It is to be wished that the name had been preserved of one of its members, who, by his strong and philosophical representations, saved that celebrated body from this disgrace.

Those who saw nothing in the punishment of Galileo but passion and blinded superstition, took occasion to revert to the history of a similar blunder of the Court of Rome in the middle of the eighth century. A Bavarian bishop, named Virgil, eminent both as a man of letters and politician, had asserted the existence of Antipodes, which excited in the ignorant bigots of his time no less alarm than did the motion of the earth in the seventeenth century. Pope Zachary, who was scandalized at the idea of another earth, inhabited by another race of men, and enlightened by another sun and moon (for this was the shape which Virgil's system assumed in his eyes), sent out positive orders to his legate in Bavaria. "With regard to Virgil, the philosopher, (I know not whether to call him priest,) if he own these perverse opinions, strip him of his priesthood, and drive him from the church and altars of God." But Virgil had himself occasionally acted as legate, and was moreover too necessary to his sovereign to be easily displaced. He utterly disregarded these denunciations, and during twenty-five years which elapsed before his death, retained his opinions, his bishopric of Salzburg, and his political power. He was afterwards canonized*.

Even the most zealous advocates of the authority of Rome were embarrassed in endeavouring to justify the treatment which Galileo experienced. Tiraboschi has attempted to draw a somewhat subtle distinction between the bulls of the Pope and the inquisitorial decrees which were sanctioned and approved by him; he dwells on the reflection that no one, even among the most zealous Catholics, has ever claimed infallibility as an attribute of the Inquisition, and looks upon it as a special mark of grace accorded to the Roman Catholic Church, that during the whole period in which most theologians rejected the opinions of Copernicus, as contrary to the Scriptures, the head of that Church was never permitted to compromise his infallible character by formally condemning it †.

Whatever may be the value of this

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* Annalium Bolorum, libri vii. Ingolstadii, 1554.

† La Chiesa non ha mai dichiarati eretici i sostenitori del Sistema Copernicano, e questa troppo rigorosa censura non usci che dal tribunale della Romana Inquisizione a cui niunò tra Cattolici ancor piu zelanti ha mai attribuito il diritto dell' infalli-

consolation, it can hardly be conceded, unless it be at the same time admitted that many scrupulous members of the Church of Rome have been suffered to remain in singular misapprehension of the nature and sanction of the authority to which Galileo had yielded. The words of the bull of Sixtus V., by which the Congregation of the Index was remodelled in 1588, are quoted by a professor of the University of Louvain, a zealous antagonist of Galileo, as follows: "They are to examine and expose the books which are repugnant to the Catholic doctrines and Christian discipline, and after reporting on them to us, they are to condemn them by our authority.[*]" Nor does it appear that the learned editors of what is commonly called the Jesuit's edition of Newton's "Principia" were of opinion, that in adopting the Copernican system they should transgress a mandate emanating from any thing short of infallible wisdom. The remarkable words which they were compelled to prefix to their book, show how sensitive the court of Rome remained, even so late as 1742, with regard to this rashly condemned theory. In their preface they say: "Newton in this third book supposes the motion of the earth. We could not explain the author's propositions otherwise than by making the same supposition. We are therefore forced to sustain a character which is not our own; but we profess to pay the obsequious reverence which is due to the decrees pronounced by the supreme Pontiffs against the motion of the earth."[†]

This coy reluctance to admit what nobody any longer doubts has survived to the present time; for Bailli informs us,[‡] that the utmost endeavours of Lalande, when at Rome, to obtain that Galileo's work should be erased from the Index, were entirely ineffectual, in consequence of the decree which had been fulminated against him; and in fact both it, and the book of Copernicus, "Nisi Corrigatur," are still to be seen on the forbidden list of 1828.

The condemnation of Galileo and his book was not thought sufficient. Urban's indignation also vented itself upon those who had been instrumental in obtaining the licence for him. The Inquisitor at Florence was reprimanded; Riccardi, the master of the sacred palace, and Ciampoli, Urban's secretary, were both dismissed from their situations. Their punishment appears rather anomalous and inconsistent with the proceedings against Galileo, in which it was assumed that his book was not properly licensed; yet the others suffered on account of granting that very licence, which he was accused of having surreptitiously obtained from them, by concealing circumstances with which they were not bound to be otherwise acquainted. Riccardi, in exculpation of his conduct, produced a letter in the hand-writing of Ciampoli, in which was contained that His Holiness, in whose presence the letter professed to be written, ordered the licence to be given. Urban only replied that this was a Ciampolism; that his secretary and Galileo had circumvented him; that he had already dismissed Ciampoli, and that Riccardi must prepare to follow him.

As soon as the ceremony of abjuration was concluded, Galileo was consigned, pursuant to his sentence, to the prison of the Inquisition. Probably it was never intended that he should long remain there, for at the end of four days, he was reconducted on a very slight representation of Nicolini to the ambassador's palace, there to await his further destination. Florence was still suffering under the before-mentioned contagion; and Sienna was at last fixed on as the place of his relegation. He would have been shut up in some convent in that city, if Nicolini had not recommended as a more suitable residence, the palace of the Archishop Piccolomini, whom he knew to be among Galileo's warmest friends. Urban consented to the change, and Galileo finally left Rome for Sienna in the early part of July.

Piccolomini received him with the utmost kindness, controlled of course by the strict injunctions which were dispatched from Rome, not to suffer him on any account to quit the confines of the palace. Galileo continued at Sienna in this state of seclusion till December of the same year, when the contagion having ceased in Tuscany, he applied for permission to return to his villa at Arcetri. This was allowed, subject to the same restrictions under which he had been residing with the archbishop.

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bilità. Anzi in cio ancora è d' ammirarsi la providenza di Dio à favor della Chiesa, percioche in un tempo in cui la maggior parte dei teologi fermamente credavano che il Sistema Copernicano fosse all' autorità delle sacre Carte contrario, pur non permise che dalla Chiesa si proferisse su cio un solenne giudizio.—Stor. della Lett. Ital.

[*] Lib. Fromondi Antaristarchus, Antwerpiæ, 1631.

[†] Newtoni Principia, Coloniæ, 1760.

[‡] Histoire de l'Astronomie Moderne.

CHAPTER XIV.

Extracts from the Dialogues on the System.

AFTER narrating the treatment to which Galileo was subject on account of his admirable Dialogues, it will not be irrelevant to endeavour, by a few extracts, to convey some idea of the style in which they are written. It has been mentioned, that he is considered to surpass all other Italian writers (unless we except Machiavelli) in the purity and beauty of his language, and indeed his principal followers, who avowedly imitated his style, make a distinguished group among the classical authors of modern Italy. He professed to have formed himself from the study of Ariosto, whose poems he passionately admired, insomuch that he could repeat the greater part of them, as well as those of Berni and Petrarca, all which he was in the frequent habit of quoting in conversation. The fashion and almost universal practice of that day was to write on philosophical subjects in Latin; and although Galileo wrote very passably in that language, yet he generally preferred the use of Italian, for which he gave his reasons in the following characteristic manner:—

"I wrote in Italian because I wished every one to be able to read what I wrote; and for the same cause I have written my last treatise in the same language: the reason which has induced me is, that I see young men brought together indiscriminately to study to become physicians, philosophers, &c., and whilst many apply to such professions who are most unfit for them, others who would be competent remain occupied either with domestic business, or with other employments alien to literature; who, although furnished, as Ruzzante might say, with a *decent set of brains*, yet, not being able to understand things written in *gibberish*, take it into their heads, that in these crabbed folios there must be some grand *hocus pocus* of logic and philosophy much too high up for them to think of jumping at. I want them to know, that as Nature has given eyes to them just as well as to philosophers for the purpose of seeing her works, she has also given them brains for examining and understanding them."

The general structure of the dialogues has been already described*; we shall therefore premise no more than the judgment pronounced on them by a highly gifted writer, to supply the deficiencies of our necessarily imperfect analysis.

"One forms a very imperfect idea of Galileo, from considering the discoveries and inventions, numerous and splendid as they are, of which he was the undisputed author. It is by following his reasonings, and by pursuing the train of his thoughts, in his own elegant, though somewhat diffuse exposition of them, that we become acquainted with the fertility of his genius—with the sagacity, penetration, and comprehensiveness of his mind. The service which he rendered to real knowledge is to be estimated, not only from the truths which he discovered, but from the errors which he detected—not merely from the sound principles which he established, but from the pernicious idols which he overthrew. The dialogues on the system are written with such singular felicity, that one reads them at the present day, when the truths contained in them are known and admitted, with all the delight of novelty, and feels one's self carried back to the period when the telescope was first directed to the heavens, and when the earth's motion, with all its train of consequences, was proved for the first time."*

The first Dialogue is opened by an attack upon the arguments by which Aristotle pretended to determine *à priori* the necessary motions belonging to different parts of the world, and on his favourite principle that particular motions belong naturally to particular substances. Salviati (representing Galileo) then objects to the Aristotelian distinctions between the corruptible elements and incorruptible skies, instancing among other things the solar spots and newly appearing stars, as arguments that the other heavenly bodies may probably be subjected to changes similar to those which are continually occurring on the earth, and that it is the great distance alone which prevents their being observed. After a long discussion on this point, Sagredo exclaims, "I see into the heart of Simplicio, and perceive that he is much moved by the force of these too conclusive arguments; but methinks I hear him say—'Oh, to whom must we betake ourselves to settle our disputes if Aristotle be removed from the chair? What other author have we to follow in our schools, our studies, and academies? What philosopher has written on all the parts of Natural Philosophy, and so methodically as not to have overlooked a single conclusion? Must we then desolate this fabric, by which so many travellers have been sheltered? Must we destroy this asylum, this Prytaneum wherein so many students have found a convenient resting-place, where without being exposed to the injuries of the weather, one may acquire an intimate knowledge of nature, merely by turning over a few leaves? Shall we level this bulwark, behind which we are safe from every hostile attack? I pity him no less than I do one who at great expense of time and treasure, and with the labour of hundreds, has built up a very noble palace; and then, because of insecure foundations, sees it ready to fall—unable to bear that those walls be stripped that are adorned with so many beautiful pictures, or to suffer those columns to fall that uphold the stately galleries, or to see ruined the gilded roofs, the chimney-pieces, the friezes, and marble cornices erected at so much cost, he goes about it with girders and props, with shores and buttresses, to hinder its destruction."

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* See page 56.

* Playfair's Dissertation, Supp. Encyc. Brit.

Salviati proceeds to point out the many points of similarity between the earth and moon, and among others which we have already mentioned, the following remark deserves especial notice:—

"Just as from the mutual and universal tendency of the parts of the earth to form a whole, it follows that they all meet together with equal inclination, and that they may unite as closely as possible, assume the spherical form; why ought we not to believe that the moon, the sun, and other mundane bodies are also of a round figure, from no other reason than from a common instinct and natural concourse of all their component parts; of which if by accident any one should be violently separated from its whole, is it not reasonable to believe that spontaneously, and of its natural instinct, it would return? It may be added that 'if any centre of the universe may be assigned, to which the whole terrene globe if thence removed would seek to return, we shall find most probable that the sun is placed in it, as by the sequel you shall understand."

Many who are but superficially acquainted with the History of Astronomy, are apt to suppose that Newton's great merit was in his being the first to suppose an attractive force existing in and between the different bodies composing the solar system. This idea is very erroneous; Newton's discovery consisted in conceiving and proving the identity of the force with which a stone falls, and that by which the moon falls, towards the earth (on an assumption that this force becomes weaker in a certain proportion as the distance increases at which it operates), and in generalizing this idea, in applying it to all the visible creation, and tracing the principle of universal gravitation with the assistance of a most refined and beautiful geometry into many of its most remote consequences. But the general notion of an attractive force between the sun, moon, and planets, was very commonly entertained before Newton was born, and may be traced back to Kepler, who was probably the first modern philosopher who suggested it. The following extraordinary passages from his "Astronomy" will shew the nature of his conceptions on this subject:—

"The true doctrine of gravity is founded on these axioms: every corporeal substance, so far forth as it is corporeal, has a natural fitness for resting in every place where it may be situated by itself beyond the sphere of influence of its cognate body. Gravity is a mutual affection between cognate bodies towards union or conjunction (similar in kind to the magnetic virtue), so that the earth attracts a stone much rather than the stone seeks the earth. Heavy bodies (if in the first place we put the earth in the centre of the world) are not carried to the centre of the world in its quality of centre of the world, but as to the centre of a cognate round body, namely the earth. So that wheresoever the earth may be placed or whithersoever it may be carried by its animal faculty, heavy bodies will always be carried towards it. If the earth were not round heavy bodies would not tend from every side in a straight line towards the centre of the earth, but to different points from different sides. If two stones were placed in any part of the world near each other and beyond the sphere of influence of a third cognate body, these stones, like two magnetic needles, would come together in the intermediate point, each approaching the other by a space proportional to the comparative mass of the other. If the moon and earth were not retained in their orbits by their animal force or some other equivalent, the earth would mount to the moon by a fifty-fourth part of their distance, and the moon fall towards the earth through the other fifty-three parts, and would there meet, assuming however that the substance of both is of the same density. If the earth should cease to attract its waters to itself, all the waters of the sea would be raised, and would flow to the body of the moon [*]."

He also conjectured that the irregularities in the moon's motion were caused by the joint action of the sun and earth, and recognized the mutual action of the sun and planets, when he declared the mass and density of the sun to be so great that the united attraction of the other planets cannot remove it from its place. Among these bold and brilliant ideas, his temperament led him to introduce others which show how unsafe it was to follow his guidance, and which account for, if they do not altogether justify, the sarcastic remark of Ross, that "Kepler's opinion that the planets are moved round by the sunne, and that this is done by sending forth a magnetic virtue, and that the sun-beames are like the teethe of a wheele taking hold of the planets, are senslesse crotchets fitter for a wheeler or a miller than a philosopher."[†] Roberval took up Kepler's notions, especially in the tract which he falsely attributed to Aristarchus, and it is much to be regretted that Roberval should deserve credit for anything connected with that impudent fraud. The principle of universal gravitation, though not the varying proportion, is distinctly assumed in it, as the following passages will sufficiently prove: "In every single particle of the earth, and the terrestrial elements, is a certain property or accident which we suppose common to the whole system of the world, by virtue of which all its parts are forced together, and reciprocally attract each other; and this property is found in a greater or less degree in the different particles, according to their density. If the earth be considered by itself, its centres of magnitude and virtue, or gravity, as we usually call it, will coincide, to which all its parts tend in a straight line, as well by their own exertion or gravity, as by the reciprocal attraction of all the rest." In a subsequent chapter, Roberval repeats these passages nearly in the same words, applying them to the whole solar system, adding, that "the force of this attraction is not to be considered as residing in the centre itself, as some ignorant people think, but in the whole system whose parts are equally disposed round the centre[*]". This very curious work was reprinted in the third volume of the *Reflexiones Physico-Mathematicæ* of Mersenne, from whom Roberval pretended to have received the Arabic manuscript, and who is thus irretrievably implicated in the forgery.[†] The last remark, denying the attractive force to be due to any property of the central point, seems aimed at Aristotle, who, in a no less curious passage, maintaining exactly the opposite opinion, says, "Hence, we may better understand what the ancients have related, that like things are wont to have a tendency to each other. For this is not absolutely true; for if the earth were to be removed to the place now occupied by the moon, no part of the earth would then have a tendency towards that place, but would still fall towards the point which the earth's centre now occupies."[‡] Mersenne considered the consequences of the attractive force of each particle of matter so far as to remark, that if a body were supposed to fall towards the centre of the earth, it would be retarded by the attraction of the part through which it had already fallen.[§] Galileo had not altogether neglected to speculate on such a supposition, as is plain from the following extract. It is taken from a letter to Carcaville, dated from Arcetri, in 1637. "I will say farther, that I have not absolutely and clearly satisfied myself that a heavy body would arrive sooner at the centre of the earth, if it began to fall from the distance only of a single yard, than another which should start from the distance of a thousand miles. I do not affirm this, but I offer it as a paradox." [¶]

It is very difficult to offer any satisfactory comment upon this passage; it may be sufficient to observe that this paradoxical result was afterwards deduced by Newton, as one of the consequences of the general law with which all nature is pervaded, but with which there is no reason to believe that Galileo had any acquaintance; indeed the idea is fully negatived by other passages in this same letter. This is one of the many instances from which we may learn to be cautious how we invest detached passages of the earlier mathematicians with a meaning which in many cases their authors did not contemplate. The progressive development of these ideas in the hands of Wallis, Huyghens, Hook, Wren, and Newton, would lead us too far from our principal subject. There is another passage in the third dialogue connected with this subject, which it may be as well to notice in this place. "The parts of the earth have such a propensity to its centre, that when it changes its place, although they may be very distant from the globe at the time of the change, yet must they follow. An example similar to this is the perpetual sequence of the Medicean stars, although always separated from Jupiter. The same may be said of the moon, obliged to follow the earth. And this may serve for those simple ones who have difficulty in comprehending how these two globes, not being chained together, nor strung upon a pole, mutually follow each other, so that on the acceleration or retardation of the one, the other also moves quicker or slower."

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[*] Astronomia Nova. Pragæ. 1609.

[†] The new Planet no Planet, or the Earth no wandering Star, except in the wandering heads of Galileans. London, 1646.

[*] Aristarchi Samii de Mundi Systemate. Parisiis 1644.

[†] See page 12.

[‡] De Cœlo, lib. iv. cap. 3.

[§] Reflexiones Physico-Mathematicæ, Parisiis, 1647.

[¶] Venturi.

The second Dialogue is appropriated chiefly to the discussion of the diurnal motion of the earth; and the principal arguments urged by Aristotle, Ptolemy, and others, are successively brought forward and confuted. The opposers of the earth's diurnal motion maintained, that if it were turning round, a stone dropped from the top of a tower would not fall at its foot; but, by the rotation of the earth to the eastward carrying away the tower with it, would be left at a great distance to the westward; it was common to compare this effect to a stone dropped from the mast-head of a ship, and without any regard to truth it was boldly asserted that this would fall considerably nearer the stern than the foot of the mast, if the ship were in rapid motion. The same argument was presented in a variety of forms,—such as that a cannon-ball shot perpendicularly upwards would not fall at the same spot; that if fired to the eastward it would fly farther than to the westward; that a mark to the east or west would never be hit, because of the rising or sinking of the horizon during the flight of the ball; that ladies ringlets would all stand out to the westward,* with other conceits of the like nature: to which the general reply is given, that in all these cases the stone, or ball, or other body, participates equally in the motion of the earth, which, therefore, so far as regards the relative motion of its parts, may be disregarded. The manner in which this is illustrated, appears in the following extract from the dialogue:—*Sagredo.* If the nib of a writing pen which was in the ship during my voyage direct from Venice to Alexandria, had had the power of leaving a visible mark of all its path, what trace, what mark, what line would it have left?—"*Simplicio.* It would have left a line stretched out thither from Venice not perfectly straight, or to speak more correctly, not perfectly extended in an exact circular arc, but here and there more and less curved accordingly as the vessel had pitched more or less; but this variation in some places of one or two yards to the right or left, or up or down in a length of many hundred miles, would have occasioned but slight alteration in the whole course of the line, so that it would have been hardly sensible, and without any great error we may speak of it as a perfectly circular arc.—*Sagred.* So that the true and most exact motion of the point of the pen would also have been a perfect arc of a circle if the motion of the vessel, abstracting from the fluctuations of the waves, had been steady and gentle; and if I had held this pen constantly in my hand, and had merely moved it an inch or two one way or the other, what alteration would that have made in the true and principal motion?—*Simpl.* Less than that which would be occasioned in a line a thousand yards long, by varying here and there from perfect straightness by the quantity of a flea's eye.—*Sagred.* If then a painter on our quitting the port had begun to draw with this pen on paper, and had continued his drawing till we got to Alexandria, he would have been able by its motion, to produce an accurate representation of many objects perfectly shadowed, and filled up on all sides with landscapes, buildings, and animals, although all the true, real, and essential motion of the point of his pen would have been no other but a very long and very simple line; and as to the peculiar work of the painter, he would have drawn it exactly the same if the ship had stood still. Therefore, of the very protracted motion of the pen, there remain no other traces than those marks drawn upon the paper, the reason of this being that the great motion from Venice to Alexandria was common to the paper, the pen, and everything that was in the ship; but the trifling motion forwards and backwards, to the right and left, communicated by the painter's fingers to the pen, and not to the paper, from being peculiar to the pen, left its mark upon the paper, which as to this motion was immoveable. Thus it is likewise true that in the supposition of the earth's rotation, the motion of a falling stone is really a long track of many hundreds and thousands of yards; and if it could have delineated its course in the calm air, or on any other surface, it would have left behind it a very long transversal line; but that part of all this motion which is common to the stone, the tower, and ourselves, is imperceptible by us and the same as if not existing, and only that part remains to be observed of which neither we nor the tower partake, which in short is the fall of the stone along the tower."

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* Riccioli.

The mechanical doctrines introduced into this second dialogue will be noticed on another occasion; we shall pass on to other extracts, illustrative of the general character of Galileo's reasoning:—"*Salviati.* I did not say that the earth has no principle, either internal or external, of its motion of rotation, but I do say that I know not which of the two it has, and that my ignorance has no power to take its motion away; but if this author knows by what principle other mundane bodies, of the motion of which we are certain, are turned round, I say that what moves the Earth is something like that by which Mars and Jupiter, and, as he believes, the starry sphere, are moved round; and if he will satisfy me as to the cause of their motion, I bind myself to be able to tell him what moves the earth. Nay more; I undertake to do the same if he can teach me what it is which moves the parts of the earth downwards.—*Simpl.* The cause of this effect is notorious, and every one knows that it is Gravity.—*Salv.* You are out, Master Simplicio; you should say that every one knows that it is called Gravity; but I do not ask you the name but the nature of the thing, of which nature you do not know one tittle more than you know of the nature of the moving cause of the rotation of the stars, except it be the name which has been given to the one, and made familiar and domestic, by the frequent experience we have of it many thousand times in a day; but of the principle or virtue by which a stone falls to the ground, we really know no more than we know of the principle which carries it upwards when thrown into the air, or which carries the moon round its orbit, except, as I have said, the name of gravity which we have peculiarly and exclusively assigned to it; whereas we speak of the other with a more generic term, and talk of the virtue impressed, and call it either an assisting or an informing intelligence, and are content to say that Nature is the cause of an infinite number of other motions."

Simplicio is made to quote a passage from Scheiner's book of Conclusions against Copernicus, to the following effect:—"'If the whole earth and water were annihilated, no hail or rain would fall from the clouds, but would only be naturally carried round in a circle, nor would any fire or fiery thing ascend, since, according to the not improbable opinion of these others, there is no fire in the upper regions.'—*Salv.* The foresight of this philosopher is most admirable and praiseworthy, for he is not content with providing for things that might happen during the common course of nature, but persists in shewing his care for the consequences of what he very well knows will never come to pass. Nevertheless, for the sake of hearing some of his notable conceits, I will grant that if the earth and water were annihilated there would be no more hail or rain, nor would fiery matter ascend any more, but would continue a motion of revolution. What is to follow? What conclusion is the philosopher going to draw?—*Simpl.* This objection is in the very next words—'Which nevertheless (says he) is contrary to experience and reason.'—*Salv.* Now I must yield: since he has so great an advantage over me as experience, with which I am quite unprovided. For hitherto I have never happened to see the terrestial earth and water annihilated, so as to be able to observe what the hail and fire did in the confusion. But does he tell us for our information at least what they did?—*Simp.* No, he does not say any thing more.—

Salv. I would give something to have a word or two with this person, to ask him whether, when this globe vanished, it also carried away the common centre of gravity, as I fancy it did, in which case I take it that the hail and water would remain stupid and confounded amongst the clouds, without knowing what to do with themselves. . . . And lastly, that I may give this philosopher a less equivocal answer, I tell him that I know as much of what would follow after the annihilation of the terrestrial globe, as he could have known what was about to happen in and about it, before it was created."

Great part of the third Dialogue is taken up with discussions on the parallax of the new stars of 1572 and 1604, in which Delambre notices that Galileo does not employ logarithms in his calculations, although their use had been known since Napier discovered them in 1616: the dialogue then turns to the annual motion "first taken from the Sun and conferred upon the Earth by Aristarchus Samius, and afterwards by Copernicus." Salviati speaks of his contemporary philosophers with great contempt—"If you had ever been worn out as I have been many and many a time with hearing what sort of stuff is sufficient to make the obstinate vulgar unpersuadable, I do not say to agree with, but even to listen to these novelties, I believe your wonder at finding so few followers of these opinions would greatly fall off. But little regard in my judgment is to be had of those understandings who are convinced and immoveably persuaded of the fixedness of the earth, by seeing that they are not able to breakfast this morning at Constantinople, and sup in the evening in Japan, and who feel satisfied that the earth, so heavy as it is, cannot climb up above the sun, and then come tumbling in a breakneck fashion down again!"* This remark serves to introduce several specious arguments against the annual motion of the earth, which are successively confuted, and it is shewn how readily the apparent stations and retrogradations of the planets are accounted for on this supposition.

The following is one of the frequently recurring passages in which Galileo, whilst arguing in favour of the enormous distances at which the theory of Copernicus necessarily placed the fixed stars, inveighs against the arrogance with which men pretend to judge of matters removed above their comprehension. "*Simpl.* All this is very well, and it is not to be denied that the heavens may surpass in bigness the capacity of our imaginations, as also that God might have created it yet a thousand times larger than it really is, but we ought not to admit anything to be created in vain, and useless in the universe. Now whilst we see this beautiful arrangement of the planets, disposed round the earth at distances proportioned to the effects they are to produce on us for our benefit, to what purpose should a vast vacancy be afterwards interposed between the orbit of Saturn and the starry spheres, containing not a single star, and altogether useless and unprofitable? to what end? for whose use and advantage?—*Salv.* Methinks we arrogate too much to ourselves, Simplicio, when we will have it that the care of us alone is the adequate and sufficient work and bound, beyond which the divine wisdom and power does and disposes of nothing. I feel confident that nothing is omitted by the Divine Providence of what concerns the government of human affairs; but that there may not be other things in the universe dependant upon His supreme wisdom, I cannot for myself, by what my reason holds out to me, bring myself to believe. So that when I am told of the uselessness of an immense space interposed between the orbits of the planets and the fixed stars, empty and valueless, I reply that there is temerity in attempting by feeble reason to judge the works of God, and in calling vain and superfluous every part of the universe which is of no use to us.—*Sagr.* Say rather, and I believe you would say better, that we have no means of knowing what is of use to us; and I hold it to be one of the greatest pieces of arrogance and folly that can be in this world to say, because I know not of what use Jupiter or Saturn are to me, that therefore these planets are superfluous; nay more, that there are no such things in nature. To understand what effect is worked upon us by this or that heavenly body (since you will have it that all their use must have a reference to us), it would be necessary to remove it for a while, and then the effect which I find no longer produced in me, I may say that it depended upon that star. Besides, who will dare say that the space which they call too vast and useless between Saturn and the fixed stars is void of other bodies belonging to the universe. Must it be so because we do not see them: then I suppose the four Medicean planets, and the companions of Saturn, came into the heavens when we first began to see them, and not before! and, by the same rule, the other innumerable fixed stars did not exist before men saw them. The nebulæ were till lately only white flakes, till with the telescope we have made of them constellations of bright and beautiful stars. Oh presumptuous! rather, Oh rash ignorance of man!"

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* The notions commonly entertained of 'up' and 'down,' as connected with the observer's own situation, had long been a stumbling-block in the way of the new doctrines. When Columbus held out the certainty of arriving in India by sailing to the westward on account of the earth's roundness, it was gravely objected, that it might be well enough to sail down to India, but that the chief difficulty would consist in climbing up back again.

After a discussion on Gilbert's Theory of Terrestrial Magnetism, introduced by the parallelism of the earth's axis, and of which Galileo praises very highly both the method and results, the dialogue proceeds as follows:—"*Simpl.* It appears to me that Sig. Salviati, with a fine circumlocution, has so clearly explained the cause of these effects, that any common understanding, even though unacquainted with science, may comprehend it: but we, confining ourselves to the terms of art, reduce the cause of these and other similar natural phenomena to sympathy, which is a certain agreement and mutual appetency arising between things which have the same qualities, just as, on the other hand, that disagreement and aversion, with which other things naturally repel and abhor each other, we style antipathy.—*Sagr.* And thus with these two words they are able to give a reason for the great number of effects and accidents which we see, not without admiration, to be produced in Nature. But it strikes me that this mode of philosophising has a great sympathy with the style in which one of my friends used to paint: on one part of the canvas he would write with chalk—there I will have a fountain, with Diana and her nymphs; here some harriers; in this corner I will have a huntsman, with a stag's head; the rest may be a landscape of wood and mountain; and what remains to be done may be put in by the colourman: and thus he flattered himself that he had painted the story of Actæon, having contributed nothing to it beyond the names."

The fourth Dialogue is devoted entirely to an examination of the tides, and is a development and extension of the treatise already mentioned to have been sent to the Archduke Leopold, in 1618*. Galileo was uncommonly partial to his theory of the tides, from which he thought to derive a direct proof of the earth's motion in her orbit; and although his theory was erroneous, it required a farther advance in the science of motion than had been attained even at a much later period to point out the insufficiency of it. It is well known that the problem of explaining the cause of this alternate motion of the waters had been considered from the earliest ages one of the most difficult that could be proposed, and the solutions with which different inquirers were obliged to rest contented, shew that it long deserved the name given to it, of "the grave of human curiosity†." Riccioli has enumerated several of the opinions which in turn had their favourers and supporters. One party supposed the rise of the waters to be occasioned by the influx of rivers into the sea; others compared the earth to a large animal, of which the tides indicated the respiration; a third theory supposed the existence of subterraneous fires, by which the sea was periodically made to boil; others attributed the cause of a similar change of temperature to the sun and moon.

There is an unfounded legend, that Aristotle drowned himself in despair of being able to invent a plausible explanation of the extraordinary tides in the Euripus. His curiosity on the subject does not appear to have been so acute (judging from his writings) as this story would imply. In one of his books he merely mentions a rumour, that there are great elevations or swellings of the seas, which recur periodically, according to the course of the moon. Lalande, in the fourth volume of his Astronomy, has given an interesting account of the opinion of the connection of the tides with the moon's motion. Pytheas of Marseilles, a contemporary of Aristotle, was the first who has been recorded as observing, that the full tides occur at full moon, and the ebbs at new moon‡. This is not quite correctly stated; for the tide of new moon is known to be still higher than the rise at the full, but it is likely enough, that the seeming inaccuracy should be attributed, not to

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* See page 50. † Riccioli Almag. Nov.

‡ Plutarch. De placit. Philos. lib. iii. c. 17.

Pytheas, but to his biographer Plutarch, who, in many instances, appears to have viewed the opinions of the old philosophers through the mist of his own prejudices and imperfect information. The fact is, that, on the same day when the tide rises highest, it also ebbs lowest; and Pytheas, who, according to Pliny, had recorded a tide in Britain of eighty cubits, could not have been ignorant of this. Posidonius, as quoted by Strabo, maintained the existence of three periods of the tide, daily, monthly, and annual, "in sympathy with the moon."[*] Pliny, in his vast collection of natural observations, not unaptly styled the Encyclopædia of the Antients, has the following curious passages:—"The flow and ebb of the tide is very wonderful; it happens in a variety of ways, but the cause is in the sun and moon[†]." He then very accurately describes the course of the tide during a revolution of the moon, and adds: "The flow takes place every day at a different hour; being waited on by the star, which rises every day in a different place from that of the day before, and with greedy draught drags the seas with it[‡]." "When the moon is in the north, and further removed from the earth, the tides are more gentle than when digressing to the south, she exerts her force with a closer effort[§]."

The College of Jesuits at Coimbra appears to deserve the credit of first clearly pointing out the true relation between the tides and the moon, which was also maintained a few years later by Antonio de Dominis and Kepler. In the Society's commentary on Aristotle's book on Meteors, after refuting the notion that the tides are caused by the light of the sun and moon, they say, "It appears more probable to us, without any rarefaction, of which there appears no need or indication, that the moon raises the waters by some inherent power of impulsion, in the same manner as a magnet moves iron; and according to its different aspects and approaches to the sea, and the obtuse or acute angles of its bearing, at one time to attract and raise the waters along the shore, and then again to leave them to sink down by their own weight, and to gather into a lower level.[*]" The theory of Universal Gravitation seems here within the grasp of these philosophers, but unfortunately it did not occur to them that possibly the same attraction might be exerted on the earth as well as the water, and that the tide was merely an effect of the diminution of force, owing to the increase of distance, with which the centre of the earth is attracted, as compared with that exerted on its surface. This idea, so happily seized afterwards by Newton, might at once have furnished them with a satisfactory explanation of the tide, which is observed on the opposite side of the earth as well as immediately under the moon. They might have seen that in the latter case the centre of the earth is pulled away from the water, just as in the former the water is pulled away from the centre of the earth, the sensible effect to us being in both cases precisely the same. For want of this generalization, the inferior tide as it is called presented a formidable obstacle to this theory, and the most plausible explanation that was given was, that this magnetic virtue radiated out from the moon was reflected by the solid heavens, and concentrated again as in a focus on the opposite side of the earth. The majority of modern astronomers who did not admit the existence of any solid matter fit for producing the effect assigned to it, found a reasonable difficulty in acquiescing in this explanation. Galileo, who mentions the Archbishop of Spalatro's book, treated the theory of attraction by the moon as absurd. "This motion of the seas is local and sensible, made in an immense mass of water, and cannot be brought to obey light, and warmth, and predominancy of occult qualities, and such like vain fancies; all which are so far from being the cause of the tide, that on the contrary the tide is the cause of them, inasmuch as it gives rise to these ideas in brains which are more apt for talkativeness and ostentation, than for speculation and inquiry into the secrets of Nature; who, rather than see themselves driven to pronounce these wise, ingenuous, and modest words—*I do not know*,—will blurt out from their tongues and pens all sorts of extravagancies."

Galileo's own theory is introduced by the following illustration, which indeed probably suggested it, as he was in the habit of suffering no natural phenomena, however trivial in appearance, to escape him. He felt the advantage of this custom in being furnished on all occasions with a stock of homely illustrations, to which the daily experience of his hearers readily assented, and which he could shew to be identical in principle with the phenomena under discussion. That he was mistaken in applying his observations in the present instance cannot be urged against the incalculable value of such a habit.

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[*] *συμπαθως τη σεληνη*. Geographiæ, lib. iii.

[†] Historia Naturalis, lib. ii. c. 97.

[‡] Ut ancillante sidere, trahenteque secum avido haustu maria.

[§] Eâdem Aquiloniâ, *et* à terris longius recedente, mitiores quam cum, in Austros digressâ, propiore nisu vim suam exercet.

[*] Commentarii Collegii Conimbricensis. Coloniæ, 1603.

"We may explain and render sensible these effects by the example of one of those barks which come continually from Lizza Fusina, with fresh water for the use of the city of Venice. Let us suppose one of these barks to come thence with moderate velocity along the canal, carrying gently the water with which it is filled, and then, either by touching the bottom, or from some other hindrance which is opposed to it, let it be notably retarded; the water will not on that account lose like the bark the impetus it has already acquired, but will forthwith run on towards the prow where it will sensibly rise, and be depressed at the stern. If on the contrary the said vessel in the middle of its steady course shall receive a new and sensible increase of velocity, the contained water before giving into it will persevere for some time in its slowness, and will be left behind that is to say towards the stern where consequently it will rise, and sink at the head.—Now, my masters, that which the vessel does in respect of the water contained in it, and that which the water does in respect of the vessel containing it, is the same to a hair as what the Mediterranean vase does in respect of the water which it contains, and that the waters do in respect of the Mediterranean vase which contains them. We have now only to demonstrate how, and in what manner it is true that the Mediterranean, and all other gulfs, and in short all the parts of the earth move with a motion sensibly not uniform, although no motion results thence to the whole globe which is not perfectly uniform and regular."

This unequable motion is derived from a combination of the earth's motion on her axis, and in her orbit, the consequence of which is that a point under the sun is carried in the same direction by the annual and diurnal velocities, whereas a point on the opposite side of the globe is carried in opposite directions by the annual and diurnal motions, so that in every twenty-four hours the absolute motion through space of every point in the earth completes a cycle of varying swiftness. Those readers who are unacquainted with the mathematical theory of motion must be satisfied with the assurance that this specious representation is fallacious, and that the oscillation of the water does not in the least result from the causes here assigned to it: the reasoning necessary to prove this is not elementary enough to be introduced here with propriety.

Besides the principal daily oscillation of the water, there is a monthly inequality in the rise and fall, of which the extremes are called the spring and neap tides: the manner in which Galileo attempted to bring his theory to bear upon these phenomena is exceedingly curious.

"It is a natural and necessary truth, that if a body be made to revolve, the time of revolution will be greater in a greater circle than in a less: this is universally allowed, and fully confirmed by experiments, such for instance as these:—In wheel clocks, especially in large ones, to regulate the going, the workmen fit up a bar capable of revolving horizontally, and fasten two leaden weights to the ends of it; and if the clock goes too slow, by merely approaching these weights somewhat towards the centre of the bar, they make its vibrations more frequent, at which time they are moving in smaller circles than before*.—Or, if you fasten a weight to a cord which you pass round a pulley in the ceiling, and whilst the weight is vibrating draw in the cord towards you, the vibrations will become sensibly accelerated as the length of the string diminishes. We may observe the same rule to hold among the celestial motions of the planets, of which we have a ready instance in the Medicean planets, which revolve in such short periods round Jupiter. We may therefore safely conclude, that if the moon for instance shall continue to be forced round by the same moving power, and were to move in a smaller circle, it would shorten the time of its revolution. Now this very thing happens in fact to the moon, which I have just advanced on a supposition. Let us call to mind that we have already concluded with Copernicus, that it is impossible to separate the moon from the earth, round which without doubt it moves in a month: we must also remember that the globe of the earth, accompanied always by the moon, revolves in the great circle round the sun in a year, in which time the moon revolves round the earth about thirteen times, whence it follows that the moon is sometimes near the sun, that is to say between the earth and sun, sometimes far from it, when she is on the outside of the earth. Now if it be true that the power which moves the earth and the moon round the sun remains of the same efficacy, and if it be true that the same moveable, acted on by the same force, passes over similar arcs of circles in a time which is least when the circle is smallest, we are forced to the conclusion that at new moon, when in conjunction with the sun, the moon passes over greater arcs of the orbit round the sun, than when in opposition at full moon; and this inequality of the moon will be shared by the earth also. So that exactly the same thing happens as in the balance of the clocks; for the moon here represents the leaden weight, which at one time is fixed at a greater distance from the centre to make the vibrations slower, and at another time nearer to accelerate them."

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* See fig. 1. p. 96.

Wallis adopted and improved this theory in a paper which he inserted in the Philosophical Transactions for 1666, in which he declares, that the circular motion round the sun should be considered as taking place at a point which is the centre of gravity of the earth and moon. "To the first objection, that it appears not how two bodies that have no tie can have one common centre of gravity, I shall only answer, that it is harder to show how they have it, than that they have it*." As Wallis was perfectly competent from the time at which he lived, and his knowledge of the farthest advances of science in his time, to appreciate the value of Galileo's writings, we shall conclude this chapter with the judgment that he has passed upon them in the same paper. "Since Galileo, and after him Torricelli and others have applied mechanical principles to the solving of philosophical difficulties, natural philosophy is well known to have been rendered more intelligible, and to have made a much greater progress in less than a hundred years than before for many ages."

Chapter XV.

Galileo at Arcetri—Becomes Blind—Moon's Libration—Publication of the Dialogues on Motion.

We have already alluded to the imperfect state of the knowledge possessed with regard to Galileo's domestic life and personal habits; there is reason however to think that unpublished materials exist from which these outlines might be in part filled up. Venturi informs us that he had seen in the collection from which he derived a great part of the substance of his Memoirs of Galileo, about one hundred and twenty manuscript letters, dated between the years 1623 and 1633, addressed to him by his daughter Maria, who with her sister had attached herself to the convent of St. Matthew, close to Galileo's usual place of residence. It is difficult not to think that much interesting information might be obtained from these, with respect to Galileo's domestic character. The very few published extracts confirm our favourable impressions of it, and convey a pleasing idea of this his favourite daughter. Even when, in her affectionate eagerness to soothe her father's wounded feelings at the close of his imprisonment in Rome, she dwells with delight upon her hopes of being allowed to relieve him, by taking on herself the penitential recitations which formed a part of his sentence, the prevalent feeling excited in every one by the perusal must surely be sympathy with the filial tenderness which it is impossible to misunderstand.

The joy she had anticipated in again meeting her parent, and in compensating to him by her attentive affection the insults of his malignant enemies, was destined to be but of short duration. Almost in the same month in which Galileo returned to Arcetri she was seized with a fatal illness; and already in the beginning of April, 1634, we learn her death from the fruitless condolence of his friends. He was deeply and bitterly affected by this additional blow, which came upon him when he was himself in a weak and declining state of health, and his answers breathe a spirit of the most hopeless and gloomy despondency.

In a letter written in April to Bocchineri, his son's father-in-law, he says: "The hernia has returned worse than at first: my pulse is intermitting, accompanied with a palpitation of the heart; an immeasurable sadness and melancholy; an entire loss of appetite; I am hateful to myself; and in short I feel that I am called incessantly by my dear daughter. In this state, I do not think it advisable that Vincenzo should set out on his journey, and leave me, when every hour something may occur, which would make it expedient that he should be here." In this extremity of ill health, Galileo requested leave to go to Florence for the advantage of medical assistance; but far from obtaining permission, it was intimated that any additional importunities would be noticed by depriving him of the partial liberty he was then allowed to enjoy. After several years confinement at Arcetri, during the whole of which time he suffered from continual indisposition, the inquisitor Fariano wrote to him in 1638, that the Pope permitted his removal to Florence, for the purpose of recovering his health; requiring him at the same time to present himself at the Office of the Inquisition, where he would learn the conditions on which this favour had been granted. These were that he should neither quit his house nor receive his friends there; and so closely was the letter of these instructions adhered to, that he was obliged to obtain a special permission to go out to attend mass during Passion week. The strictness with which all personal intercourse with his friends was interrupted, is manifest from the result of the following letter from the Duke of Tuscany's secretary of state to Nicolini, his ambassador at Rome. "Signor Galileo Galilei, from his great age and the illnesses which afflict him, is in a condition soon to go to another world; and although in this the eternal memory of his fame and value is already secured, yet his Highness is greatly desirous that the world should sustain as little loss as possible by his death; that his labours may not perish, but for the public good may be brought to that perfection which he will not be able to give them. He has in his thoughts many things worthy of him, which he cannot be prevailed on to communicate to any but Father Benedetto Castelli, in whom he has entire confidence. His Highness wishes therefore that you should see Castelli, and induce him to procure leave to come to Florence for a few months for this purpose, which his Highness has very much at heart; and if he obtains permission, as his Highness hopes, you will furnish him with money and every thing else he may require for his journey." Castelli, it will be remembered, was at this time salaried by the court of Rome. Nicolini answered that Castelli had been himself to the Pope to ask leave to go to Florence. Urban immediately intimated his suspicions that his design was to see Galileo, and upon Castelli's stating that certainly it would be impossible for him to refrain from attempting to see him, he received permission to visit him in the company of an officer of the Inquisition. At the end of some months Galileo was remanded to Arcetri, which he never again quitted.

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* Phil. Trans., No. 16, August 1666.

In addition to his other infirmities, a disorder which some years before had affected the sight of his right eye returned in 1636; in the course of the ensuing year the other eye began to fail also, and in a few months he became totally blind. It would be difficult to find any even among those who are the most careless to make a proper use of the invaluable blessing of sight, who could bear unmoved to be deprived of it, but on Galileo the loss fell with peculiar and terrible severity; on him who had boasted that he would never cease from using the senses which God had given him, in declaring the glory of his works, and the business of whose life had been the splendid fulfilment of that undertaking. "The noblest eye is darkened," said Castelli, "which nature ever made: an eye so privileged, and gifted with such rare qualities, that it may with truth be said to have seen more than all of those who are gone, and to have opened the eyes of all who are to come." His own patience and resignation under this fatal calamity are truly wonderful; and if occasionally a word of complaint escaped him, it was in the chastened tone of the following expressions—"Alas! your dear friend and servant Galileo has become totally and irreparably blind; so that this heaven, this earth, this universe, which with wonderful observations I had enlarged a hundred and thousand times beyond the belief of by-gone ages, henceforward for me is shrunk into the narrow space which I myself fill in it.—So it pleases God: it shall therefore please me also." Hopes were at first entertained by Galileo's friends, that the blindness was occasioned by cataracts, and that he might look forward to relief from the operation of couching; but it very soon appeared that the disorder was not in the humours of the eye, but in a cloudiness of the cornea, the symptoms of which all external remedies failed to alleviate.

As long as the power was left him, he had indefatigably continued his astronomical observations. Just before his sight began to decay, he had observed a new phenomenon in the moon, which is now known by the name of the moon's libration, the nature of which we will shortly explain. A remarkable circumstance connected with the moon's motion is, that the same side is always visible from the earth, showing that the moon turns once on her own axis in exactly the time of her monthly revolution.[*] But Galileo, who was by this time familiar with the whole of the moon's visible surface, observed that the above-mentioned effect does not accurately take place, but that a small part on either side comes alternately forward into sight, and then again recedes, according to the moon's various positions in the heavens. He was not long in detecting one of the causes of this apparent libratory or rocking motion. It is partly occasioned by our distance as spectators from the centre of the earth, which is also the centre of the moon's motion. In consequence of this, as the moon rises in the sky we get an additional view of the lower half, and lose sight of a small part of the upper half which was visible to us while we were looking down upon her when low in the horizon. The other cause is not quite so simple, nor is it so certain that Galileo adverted to it: it is however readily intelligible even to those who are unacquainted with astronomy, if they will receive as a fact that the monthly motion of the moon is not uniform, but that she moves quicker at one time than another, whilst the motion of rotation on her own axis, like that of the earth, is perfectly uniform. A very little reflection will show that the observed phenomenon will necessarily follow. If the moon did not turn on her axis, every side of her would be successively presented, in the course of a month, towards the earth; it is the motion of rotation which tends to carry the newly discovered parts out of sight.

Let us suppose the moon to be in that part of her orbit where she moves with her average motion, and that she is moving towards the part where she moves most quickly. If the motion in the orbit were to remain the same all the way round, the motion of rotation would be just sufficient at every point to bring round the same part of the moon directly in front of the earth. But since, from the supposed point, the moon is moving for some time round the earth with a motion continually growing quicker, the motion of rotation is not sufficiently quick to carry out of sight the entire part discovered by the motion of translation. We therefore get a glimpse of a narrow strip on the side *from* which the moon is moving, which strip grows broader and broader, till she passes the point where she moves most swiftly, and reaches the point of average swiftness on the opposite side of her orbit. Her motion is now continually growing slower, and therefore from this point the motion of rotation is too swift, and carries too much out of sight, or in other words, brings into sight a strip on the side *towards* which the moon is moving. This increases till she passes the point of least swiftness, and arrives at the point from which we began to trace her course, and the phenomena are repeated in the same order.

This interesting observation closes the long list of Galileo's discoveries in the heavens. After his abjuration, he ostensibly withdrew himself in a great measure from his astronomical pursuits, and employed himself till 1636 principally with his Dialogues on Motion, the last work of consequence that he published. In that year he entered into correspondence with the Elzevirs, through his friend Micanzio, on the project of printing a complete edition of his writings. Among the letters which Micanzio wrote on the subject is one intimating that he had enjoyed the gratification, in his quality of Theologian to the Republic of Venice, of refusing his sanction to a work written against Galileo and Copernicus. The temper however in which this refusal was announced, contrasts singularly with that of the Roman Inquisitors. "A book was brought to me which a Veronese Capuchin has been writing, and wished to print, denying the motion of the earth. I was inclined to let it go, to make the world laugh, for the ignorant beast entitles every one of the twelve arguments which compose his book, 'An irrefragable and undeniable demonstration,' and then adduces nothing but such childish trash as every man of sense has long discarded. For instance, this poor animal understands so much geometry and mathematics, that he brings forward as a demonstration, that if the earth could move, having nothing to support it, it must necessarily fall. He ought to have added that then we should catch all the quails. But when I saw that he speaks indecently of you, and has had the impudence to put down an account of what passed lately, saying that he is in possession of the whole of your process and sentence, I desired the man who brought it to me to go and be hanged. But you know the ingenuity of impertinence; I suspect he will succeed elsewhere, because he is so enamoured of his absurdities, that he believes them more firmly than his Bible."

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[*] Frisi says that Galileo did not perceive this conclusion (Elogio del Galileo); but see The Dial. on the System, Dial. I. pp. 61, 62, 85. Edit. 1744. Plutarch says, (*De Placitis Philos.* lib. ii. c. 28,) that the Pythagoreans believed the moon to have inhabitants fifteen times as large as men, and that their day is fifteen times as long as ours. It seems probable, that the former of these opinions was engrafted on the latter, which is true, and implies a perception of the fact in the text.

After Galileo's condemnation at Rome, he had been placed by the Inquisition in the list of authors the whole of whose writings, '*edita et edenda*,' were strictly forbidden. Micanzio could not even obtain permission to reprint the Essay on Floating Bodies, in spite of his protestations that it did not in any way relate to the Copernican theory. This was the greatest stigma with which the Inquisition were in the habit of branding obnoxious authors; and, in consequence of it, when Galileo had completed his Dialogues on Motion, he found great difficulty in contriving their publication, the nature of which may be learned from the account which Pieroni sent to Galileo of his endeavours to print them in Germany. He first took the manuscript to Vienna, but found that every book printed there must receive the approbation of the Jesuits; and Galileo's old antagonist, Scheiner, happening to be in that city, Pieroni feared lest he should interfere to prevent the publication altogether, if the knowledge of it should reach him. Through the intervention of Cardinal Dietrichstein, he therefore got permission to have it printed at Olmutz, and that it should be approved by a Dominican, so as to keep the whole business a secret from Scheiner and his party; but during this negociation the Cardinal suddenly died, and Pieroni being besides dissatisfied with the Olmutz type, carried back the manuscript to Vienna, from which he heard that Scheiner had gone into Silesia. A new approbation was there procured, and the work was just on the point of being sent to press, when the dreaded Scheiner re-appeared in Vienna, on which Pieroni again thought it advisable to suspend the impression till his departure. In the mean time his own duty as a military architect in the Emperor's service carried him to Prague, where Cardinal Harrach, on a former occasion, had offered him the use of the newly-erected University press. But Harrach happened not to be at Prague, and this plan like the rest became abortive. In the meantime Galileo, wearied with these delays, had engaged with Louis Elzevir, who undertook to print the Dialogues at Amsterdam.

It is abundantly evident from Galileo's correspondence that this edition was printed with his full concurrence, although, in order to obviate further annoyance, he pretended that it was pirated from a manuscript copy which he sent into France to the Comte de Noailles, to whom the work is dedicated. The same dissimulation had been previously thought necessary, on occasion of the Latin translation of "The Dialogues on the System," by Bernegger, which Galileo expressly requested through his friend Deodati, and of which he more than once privately signified his approbation, presenting the translator with a valuable telescope, although he publicly protested against its appearance. The story which Bernegger introduced in his preface, tending to exculpate Galileo from any share in the publication, is by his own confession a mere fiction. Noailles had been ambassador at Rome, and, by his conduct there, well deserved the compliment which Galileo paid him on the present occasion.

As an introduction to the account of this work, which Galileo considered the best he had ever produced, it will become necessary to premise a slight sketch of the nature of the mechanical philosophy which he found prevailing, nearly as it had been delivered by Aristotle, with the same view with which we introduced specimens of the astronomical opinions current when Galileo began to write on that subject: they serve to show the nature and objects of the reasoning which he had to oppose; and, without some exposition of them, the aim and value of many of his arguments would be imperfectly understood and appreciated.

Chapter XVI.

State of the Science of Motion before Galileo.

It is generally difficult to trace any branch of human knowledge up to its origin, and more especially when, as in the case of mechanics, it is very closely connected with the immediate wants of mankind. Little has been told to us when we are informed that so soon as a man might wish to remove a heavy stone, "he would be led, by natural instinct, to slide under it the end of some long instrument, and that the same instinct would teach him either to raise the further end, or to press it downwards, so as to turn round upon some support placed as near to the stone as possible*."

Montucla's history would have lost nothing in value, if, omitting "this philosophical view of the birth of the art," he had contented himself with his previous remark, that there can be little doubt that men were familiar with the use of mechanical contrivances long before the idea occurred of enumerating or describing them, or even of examining very closely the nature and limits of the aid they are capable of affording. The most careless observer indeed could scarcely overlook that the weights heaved up with a lever, or rolled along a slope into their intended places, reached them more slowly than those which the workmen could lift directly in their hands; but it probably needed a much longer time to enable them to see the exact relation which, in these and all other machines, exists between the increase of the power to move, and the decreasing swiftness of the thing moved.

In the preface to Galileo's Treatise on Mechanical Science, published in 1592, he is at some pains to set in a clear light the real advantages belonging to the use of machines, "which (says he) I have thought it necessary to do, because, if I mistake not, I see almost all mechanics deceiving themselves in the belief that, by the help of a machine, they can raise a greater weight than they are able to lift by the exertion of the same force without it.—Now if we take any determinate weight, and any force, and any distance whatever, it is beyond doubt that we can move the weight to that distance by means of that force; because even although the force may be exceedingly small, if we divide the weight into a number of fragments, each of which is not too much for our force, and carry these pieces one by one, at length we shall have removed the whole weight; nor can we reasonably say at the end of our work, that this great weight has been moved and carried away by a force less than itself, unless we add that the force has passed several times over the space through which the whole weight has gone but once. From which it appears that the velocity of the force (understanding by velocity the space gone through in a given time) has been as many times greater than that of the weight, as the weight is greater than the force: nor can we on that account say that a great force is overcome by a small one, contrary to nature: then only might we say that nature is overcome when a small force moves a great weight as swiftly as itself, which we assert to be absolutely impossible with any machine either already or hereafter to be contrived. But since it may occasionally happen that we have but a small force, and want to move a great weight without dividing it into pieces, then we must have recourse to a machine by means of which we shall remove the given weight, with the given force, through the required space. But nevertheless the force as before will have to travel over that very same space as many times repeated as the weight surpasses its power, so that, at the end of our work, we shall find that we have derived no other benefit from our machine than that we have carried away the same weight altogether, which if divided into pieces we could have carried without the machine, by the same force, through the same space, in the same time. This is one of the advantages of a machine, because it often happens that we have a lack of force but abundance of time, and that we wish to move great weights all at once."

This compensation of force and time has been fancifully personified by saying that Nature cannot be cheated, and in scientific treatises on mechanics, is called the "principle of virtual velocities," consisting in the theorem that two weights will balance each other on any machine, no matter how complicated or intricate the connecting contrivances may be, when one weight bears to the other the same proportion that the space through which the latter would be raised bears to that through which the former would sink, in the first instant of their motion, if the machine were stirred by a third force. The whole theory of machines consists merely in generalizing and following out this principle into its consequences; combined, when the machines are in a state of motion, with another principle equally elementary, but to which our present subject does not lead us to allude more particularly.

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* Histoire des Mathématiques, vol. i. p. 97.

The credit of making known the principle of virtual velocities is universally given to Galileo; and so far deservedly, that he undoubtedly perceived the importance of it, and by introducing it everywhere into his writings succeeded in recommending it to others; so that five and twenty years after his death, Borelli, who had been one of Galileo's pupils, calls it "that mechanical principle with which everybody is so familiar*," and from that time to the present it has continued to be taught as an elementary truth in most systems of mechanics. But although Galileo had the merit in this, as in so many other cases, of familiarizing and reconciling the world to the reception of truth, there are remarkable traces before his time of the employment of this same principle, some of which have been strangely disregarded. Lagrange asserts† that the ancients were entirely ignorant of the principle of virtual velocities, although Galileo, to whom he refers it, distinctly mentions that he himself found it in the writings of Aristotle. Montucla quotes a passage from Aristotle's Physics, in which the law is stated generally, but adds that he did not perceive its immediate application to the lever, and other machines. The passage to which Galileo alludes is in Aristotle's Mechanics, where, in discussing the properties of the lever, he says expressly, "the same force will raise a greater weight, in proportion as the force is applied at a greater distance from the fulcrum, and the reason, as I have already said, is because it describes a greater circle; and a weight which is farther removed from the centre is made to move through a greater space."‡

It is true, that in the last mentioned treatise, Aristotle has given other reasons which belong to a very different kind of philosophy, and which may lead us to doubt whether he fully saw the force of the one we have just quoted. It appeared to him not wonderful that so many mechanical paradoxes (as he called them) should be connected with circular motion, since the circle itself seemed of so paradoxical a nature. "For, in the first place, it is made up of an immoveable centre, and a moveable radius, qualities which are contrary to each other. 2dly. Its circumference is both convex and concave. 3dly. The motion by which it is described is both forward and backward, for the describing radius comes back to the place from which it started. 4thly. The radius is *one;* but every point of it moves in describing the circle with a different degree of swiftness."

Perhaps Aristotle may have borrowed the idea of virtual velocities, contrasting so strongly with his other physical notions, from some older writer; possibly from Archytas, who, we are told, was the first to reduce the science of mechanics to methodical order;* and who by the testimony of his countrymen was gifted with extraordinary talents, although none of his works have come down to us. The other principles and maxims of Aristotle's mechanical philosophy, which we shall have occasion to cite, are scattered through his books on Mechanics, on the Heavens, and in his Physical Lectures, and will therefore follow rather unconnectedly, though we have endeavoured to arrange them with as much regularity as possible.

After defining a body to be that which is divisible in every direction, Aristotle proceeds to inquire how it happens that a body has only the three dimensions of length, breadth, and thickness; and seems to think he has given a reason in saying that, when we speak of two things, we do not say "all," but "both," and three is the first number of which we say "all." † When he comes to speak of motion, he says, "If motion is not understood, we cannot but remain ignorant of Nature. Motion appears to be of the nature of continuous quantities, and in continuous quantity infinity first makes its appearance; so as to furnish some with a definition who say that continuous quantity is that which is infinitely divisible.—Moreover, unless there be time, space, and a vacuum, it is impossible that there should be motion[*]."—Few propositions of Aristotle's physical philosophy are more notorious than his assertion that nature abhors a vacuum, on which account this last passage is the more remarkable, as he certainly did not go so far as to deny the existence of motion, and therefore asserts here the necessity of that of which he afterwards attempts to show the absurdity.—"Motion is the energy of what exists in power so far forth as so existing. It is that act of a moveable which belongs to its power of moving."[†] After struggling through such passages as the preceding we come at last to a resting-place.—"It is difficult to understand what motion is."—When the same question was once proposed to another Greek philosopher, he walked away, saying, "I cannot tell you, but I will show you;" an answer intrinsically worth more than all the subtleties of Aristotle, who was not humble-minded enough to discover that he was tasking his genius beyond the limits marked out for human comprehension.

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* De vi Percussionis. Bononiæ, 1667.

† Mec. Analyt.

‡ Mechanica.

* Diog. Laert. In vit. Archyt.

† De Cœlo, lib. i. c. 1.

He labours in the same manner and with the same success to vary the idea of space. He begins the next book with declaring, that "those who say there is a vacuum assert the existence of space; for a vacuum is space, in which there is no substance;" and after a long and tedious reasoning concludes that, "not only what space is, but also whether there be such a thing, cannot but be doubted."[‡] Of time he is content to say merely, that "it is clear that time is not motion, but that without motion there would be no time;"[§] and there is perhaps little fault to be found with this remark, understanding motion in the general sense in which Aristotle here applies it, of every description of change.

Proceeding after these remarks on the nature of motion in general to the motion of bodies, we are told that "all local motion is either straight, circular, or compounded of these two; for these two are the only simple sorts of motion. Bodies are divided into simple and concrete; simple bodies are those which have naturally a principle of motion, as fire and earth, and their kinds. By simple motion is meant the motion of a simple body."[*] By these expressions Aristotle did not mean that a simple body cannot have what he calls a compound motion, but in that case he called the motion violent or unnatural; this division of motion into natural and violent runs through the whole of the mechanical philosophy founded upon his principles. "Circular motion is the only one which can be endless;"[†] the reason of which is given in another place: for "that cannot be doing, which cannot be done; and therefore it cannot be that a body should be moving towards a point (*i. e.* the end of an infinite straight line) whither no motion is sufficient to bring it."[‡] Bacon seems to have had these passages in view when he indulged in the reflections which we have quoted in page 14. "There are four kinds of motion of one thing by another: Drawing, Pushing, Carrying, Rolling. Of these, Carrying and Rolling may be referred to Drawing and Pushing.[§]—The prime mover and the thing moved are always in contact."

The principle of the composition of motions is stated very plainly: "when a moveable is urged in two directions with motions bearing any ratio to each other, it moves necessarily in a straight line, which is the diameter of the figure formed by drawing the two lines of direction in that ratio;"[‖] and adds, in a singularly curious passage, "but when it is urged for any time with two motions which have an indefinitely small ratio one to another, the motion cannot be straight, so that a body describes a curve, when it is urged by two motions bearing an indefinitely small ratio one to another, and lasting an indefinitely small time."[¶]

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[*] Phys. lib. i. c. 3.

[†] Lib. iii. c. 2. The Aristotelians distinguished between things as existing in act or energy (*ενεργεια*) and things in capacity or power (*δυναμις*). For the advantage of those who may think the distinction worth attending to, we give an illustration of Aristotle's meaning, from a very acute and learned commentator:—"It (motion) is something more than dead capacity; something less than perfect actuality; capacity roused, and striving to quit its latent character; not the capable brass, nor yet the actual statue, but the capacity in energy; that is to say, the brass in fusion while it is becoming the statue and is not yet become."—"The bow moves not because it may be bent, nor because it is bent; but the motion lies between; lies in an imperfect and obscure union of the two together; is the actuality (if I may so say) even of capacity itself: imperfect and obscure, because such is capacity to which it belongs."—Harris, Philosophical Arrangements.

[‡] Lib. iv. c. 1.

[§] Lib. iv. c. 11.

[*] De Cœlo, lib. i. c. 2.

[†] Phys. lib. viii. c. 8.

[‡] De Cœlo, lib. i. c. 6.

[§] Phys. lib. vii. c. 2.

[‖] Mechanica.

[¶] *Εαν δε εν μηδενι λογῳ φερηται δυο φορας*

He seemed on the point of discovering some of the real laws of motion, when he was led to ask—"Why are bodies in motion more easily moved than those which are at rest?—And why does the motion cease of things cast into the air? Is it that the force has ceased which sent them forth, or is there a struggle against the motion, or is it through the disposition to fall, does it become stronger than the projectile force, or is it foolish to entertain doubts on this question, when the body has quitted the principle of its motion?" A commentator at the close of the sixteenth century says on this passage: "They fall because every thing recurs to its nature; for if you throw a stone a thousand times into the air, it will never accustom itself to move upwards." Perhaps we shall now find it difficult not to smile at the idea we may form of this luckless experimentalist, teaching stones to fly; yet it may be useful to remember that it is only because we have already collected an opinion from the results of a vast number of observations in the daily experience of life, that our ridicule would not be altogether misplaced, and that we are totally unable to determine by any kind of reasoning, unaccompanied by experiment, whether a stone thrown into the air would fall again to the earth, or move for ever upwards, or in any other conceivable manner and direction.

The opinion which Aristotle held, that motion must be caused by something in contact with the body moved, led him to his famous theory that falling bodies are accelerated by the air through which they pass. We will show how it was attempted to explain this process when we come to speak of more modern authors. He classed natural bodies into heavy and light, remarking at the same time that it is clear that "there are some bodies possessing neither gravity nor levity[*]." By light bodies he understood those which have a natural tendency to move from the earth, observing that "that which is lighter is not always light[†]." He maintained that the heavenly bodies were altogether devoid of gravity; and we have already had occasion to mention his assertion, that a large body falls faster than a small one in proportion to its weight[*]. With this opinion may be classed another great mistake, in maintaining that the same bodies fall through different mediums, as air or water, with velocities reciprocally proportional to their densities. By a singular inversion of experimental science, Cardan, relying on this assertion, proposed in the sixteenth century to determine the densities of air and water by observing the different times taken by a stone in falling through them[†]. Galileo inquired afterwards why the experiment should not be made with a cork, which pertinent question put an end to the theory.

There are curious traces still preserved in the poem of Lucretius of a mechanical philosophy, of which the credit is in general given to Democritus, where many principles are inculcated strongly at variance with Aristotle's notions. We find absolute levity denied, and not only the assertion that in a vacuum all things would fall, but that they would fall with the same velocity; and the inequalities which we observe are attributed to the right cause, the impediment of the air, although the error remains of believing the velocity of bodies falling through the air to be proportional to their weight[‡]. Such specimens of this earlier philosophy

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κατα μηδενα χρονον, αδυνατον ευθειαν ειναι την φοραν. Εαν γαρ τινα λογον ενεχθη εν χρονῳ τινι τουτον αναγκη τον χρονον ευθειαν ειναι φοραν δια τα προειρημενα, ὡστε περιφερεις γινεται δυο φερομενον φορας εν μηδενι λογῳ μηδενα χρονον.—i. e. $v = \frac{ds}{dt}$

[*] De Cœlo, lib. i. c. 3.

[†] Lib. iv. c. 2

[*] Phys., lib. iv. c. 8.

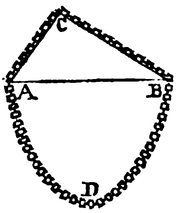
[†] De Proport. Basileæ, 1570.

[‡] "Nunc locus est, ut opinor, in his illud quoque rebus
Confirmare tibi, nullam rem posse suâ vi
Corpoream sursum ferri, sursumque meare.—
Nec quom subsiliunt ignes ad tecta domorum,
Et celeri flammâ degustant tigna trabeisque
Sponte suâ facere id sine vi subicente putandum est.
—Nonne vides etiam quantâ vi tigna trabeisque
Respuat humor aquæ? Nam quod magi' mersimus altum
Directâ et magnâ vi multi pressimus ægre:—
Tam cupide sursum revomit magis atque remittit
Plus ut parte foras emergant, exsiliantque:
—Nec tamen hæc, quantu'st in sedubitamus, opinor,
Quinvacuum per inane deorsum cuncta ferantur,
Sic igitur debent flammæ quoque posse per auras
Aeris expressæ sursum subsidere, quamquam
Pondera quantum in se est deorsum deducere pugnent.
—Quod si forte aliquis credit Graviora potesse
Corpora, quo citius rectum per Inane feruntur,
—Avius a verâ longe ratione recedit.
Nam per Aquas quæcunque cadunt atque Aera deorsum
Hæc pro ponderibus casus celerare necesse 'st
Propterea quia corpus Aquæ, naturaque tenuis
Aeris haud possunt æque rem quamque morari:
Sed citius cedunt Gravioribus exsuperata.
At contra nulli de nullâ parte, neque ullo
Tempore Inane potest Vacuum subsistere reii
Quin, sua quod natura petit, considere pergat:
Omnia quâ propter debent per Inane quietum
Æque ponderibus non æquis concita ferri."
De Rerum Natura, lib. ii, v. 184—239.

may well indispose us towards Aristotle, who was as successful in the science of motion as he was in astronomy in suppressing the knowledge of a theory so much sounder than that which he imposed so long upon the credulity of his blinded admirers.

An agreeable contrast to Aristotle's mystical sayings and fruitless syllogisms is presented in Archimedes' book on Equilibrium, in which he demonstrates very satisfactorily, though with greater cumbrousness of apparatus than is now thought necessary, the principal properties of the lever. This and the Treatise on the Equilibrium of Floating Bodies are the only mechanical works which have reached us of this writer, who was by common consent one of the most accomplished mathematicians of antiquity. Ptolemy the astronomer wrote also a Treatise on Mechanics, now lost, which probably contained much that would be interesting in the history of mechanics; for Pappus says, in the Preface to the Eighth Book of his Mathematical Collections: "There is no occasion for me to explain what is meant by a heavy, and what by a light body, and why bodies are carried up and down, and in what sense these very words 'up' and 'down' are to be taken, and by what limits they are bounded; for all this is declared in Ptolemy's Mechanics."* This book of Ptolemy's appears to have been also known by Eutocius, a commentator of Archimedes, who lived about the end of the fifth century of our era; he intimates that the doctrines contained in it are grounded upon Aristotle's; if so, its loss is less to be lamented. Pappus's own book deserves attention for the enumeration which he makes of the mechanical powers, namely, the wheel and axle, the lever, pullies, the wedge and the screw. He gives the credit to Hero and Philo of having shown, in works which have not reached us, that the theory of all these machines is the same. In Pappus we also find the first attempt to discover the force necessary to support a given weight on an inclined plane. This in fact is involved in the theory of the screw; and the same vicious reasoning which Pappus employs on this occasion was probably found in those treatises which he quotes with so much approbation. Numerous as are the faults of his pretended demonstration, it was received undoubtingly for a long period.

The credit of first giving the true theory of equilibrium on the inclined plane is usually ascribed to Stevin, although, as we shall presently show, with very little reason. Stevin supposed a chain to be placed over two inclined planes, and to hang down in the manner represented in the figure. He then urged that the chain would be in equilibrium; for otherwise, it would incessantly continue in motion, if there were any cause why it should begin to move. This being conceded, he remarks further, that the parts A D and BD are also in equilibrium, being exactly similar to each other; and therefore if they are taken away, the remaining parts A C and B C will also be in equilibrium. The weights of these parts are proportional to the lengths AC and BC; and hence Stevin concluded that two weights would balance on two inclined planes, which are to each other as the lengths of the planes included between the same parallels to the horizon.* This conclusion is the correct one, and there is certainly great ingenuity in this contrivance to facilitate the demonstration; it must not however be mistaken for an *à priori* proof, as it sometimes seems to have been: we should remember that the experiments which led to the principle of virtual velocities are also necessary to show the absurdity of supposing a perpetual motion, which is made the foundation of this theorem. That principle had been applied directly to determine the same proportion in a work written long before, where it has remained singularly concealed from the notice of most who have written on this subject. The book bears the name of Jordanus, who lived at Namur in the thirteenth century; but Commandine, who refers to it in his Commentary on Pappus, considers it as the work of an earlier period. The author takes the principle of virtual velocities for the groundwork of his explanations, both of the lever and inclined plane; the latter will not occupy much space, and in an historical point of view is too curious to be omitted.



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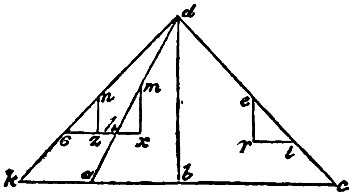
* Math. Coll. Pisani, 1662.

* Œuvres Mathématiques. Leyde. 1634.

"*Quæst.* 10.—If two weights descend by paths of different obliquities, and the proportion be the same of the weights and the inclinations taken in the same order, they will have the same descending force. By the inclinations, I do not mean the angles, but the paths up to the point in which both meet the same perpendicular.* Let, therefore, e be the weight upon $d\,c$, and h upon $d\,a$, and let e be to h as $d\,c$ to $d\,a$. I say these weights, in this situation, are equally effective. Take $d\,k$ equally inclined with $d\,c$, and upon it a weight equal to e, which call 6. If possible let e descend to l, so as to raise h to m, and



take 6 n equal to $h\,m$ or $e\,l$, and draw the horizontal and perpendicular lines as in the figure.

Then $n\,z : n\,6 :: d\,b : d\,k$
and $m\,h : m\,x :: d\,a : d\,b$
therefore $n\,z : m\,x :: d\,a : d\,k :: h : 6$, *and therefore since* $e\,r$ *is not able to raise* 6 *to* n, *neither will it be able to raise* h *to* m; therefore they will remain as they are."† The passage in Italics tacitly assumes the principle in question. Tartalea, who edited Jordanus's book in 1565, has copied this theorem *verbatim* into one of his own treatises, and from that time it appears to have attracted no further attention. The rest of the book is of an inferior description. We find Aristotle's doctrine repeated, that the velocity of a falling body is proportional to its weight; that the weight of a heavy body changes with its form; and other similar opinions. The manner in which falling bodies are accelerated by the air is given in detail. "By its first motion the heavy body will drag after it what is behind, and move what is just below it; and these when put in motion move what is next to them, so that by being set in motion they less impede the falling body. In this manner it has the effect of being heavier, and impels still more those which give way before it, until at last they are no longer impelled, but begin to drag. And thus it happens that its gravity is increased by their attraction, and their motion by its gravity, whence we see that its velocity is continually multiplied."

In this short review of the state of mechanical science before Galileo, the name of Guido Ubaldi ought not to be omitted, although his works contain little or nothing original. We have already mentioned Benedetti as having successfully attacked some of Aristotle's statical doctrines, but it is to be noticed that the laws of motion were little if at all examined by any of these writers. There are a few theorems connected with this latter subject in Cardan's extraordinary book "On Proportions," but for the most part false and contradictory. In the seventy-first proposition of his fifth book, he examines the force of the screw in supporting a given weight, and determines it accurately on the principle of virtual velocities; namely, that the power applied at the end of the horizontal lever must make a complete circuit at that distance from the centre, whilst the weight rises through the perpendicular height of the thread. The very next proposition in the same page is to find the same relation between the power and weight on an inclined plane; and although the identity of principle in these two mechanical aids was well known, yet Cardan declares the necessary sustaining force to vary as the angle of inclination of the plane, for no better reason than that such an expression will properly represent it at the two limiting angles of inclination, since the force is nothing when the plane is horizontal, and equal to the weight when perpendicular. This again shows how cautious we should be in attributing the full knowledge of general principles to these early writers, on account of occasional indications of their having employed them.

CHAPTER XVII.

Galileo's theory of Motion—Extracts from the Dialogues.

DURING Galileo's residence at Sienna, when his recent persecution had rendered astronomy an ungrateful, and indeed an unsafe occupation for his ever active mind, he returned with increased pleasure to the favourite employment of

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[*] This is not a literal translation, but by what follows, is evidently the Author's meaning. His words are, "Proportionem igitur declinationum dico non angulorum, sed linearum usque ad æquidistantem resecationem in quá æqualiter sumunt de directo."

[†] Opusculum De Ponderositate. Venetiis, 1565.

his earlier years, an inquiry into the laws and phenomena of motion. His manuscript treatises on motion, written about 1590, which are mentioned by Venturi to be in the Ducal library at Florence, seem, from the published titles of the chapters, to consist principally of objections to the theory of Aristotle; a few only appear to enter on a new field of speculation. The 11th, 13th, and 17th chapters relate to the motion of bodies on variously inclined planes, and of projectiles. The title of the 14th implies a new theory of accelerated motion, and the assertion in that of the 16th, that a body falling naturally for however great a time would never acquire more than an assignable degree of velocity, shows that at this early period Galileo had formed just and accurate notions of the action of a resisting medium. It is hazardous to conjecture how much he might have then acquired of what we should now call more elementary knowledge; a safer course will be to trace his progress through existing documents in their chronological order. In 1602 we find Galileo apologizing in a letter addressed to his early patron the Marchese Guido Ubaldi, for pressing again upon his attention the isochronism of the pendulum, which Ubaldi had rejected as false and impossible. It may not be superfluous to observe that Galileo's results are not quite accurate, for there is a perceptible increase in the time occupied by the oscillations in larger arcs; it is therefore probable that he was induced to speak so confidently of their perfect equality, from attributing the increase of time which he could not avoid remarking to the increased resistance of the air during the larger vibrations. The analytical methods then known would not permit him to discover the curious fact, that the time of a total vibration is not sensibly altered by this cause, except so far as it diminishes the extent of the swing, and thus in fact, (paradoxical as it may sound) renders each oscillation successively more rapid, though in a very small degree. He does indeed make the same remark, that the resistance of the air will not affect the time of the oscillation, but that assertion was a consequence of his erroneous belief that the time of vibration in all arcs is the same. Had he been aware of the variation, there is no reason to think that he could have perceived that this result is not affected by it. In this letter is the first mention of the theorem, that the times of fall down all the chords drawn from the lowest point of a circle are equal; and another, from which Galileo afterwards deduced the curious result, that it takes less time to fall down the curve than down the chord, notwithstanding the latter is the direct and shortest course. In conclusion he says, "Up to this point I can go without exceeding the limits of mechanics, but I have not yet been able to demonstrate that all arcs are passed in the same time, which is what I am seeking." In 1604 he addressed the following letter to Sarpi, suggesting the false theory sometimes called Baliani's, who took it from Galileo.

"Returning to the subject of motion, in which I was entirely without a fixed principle, from which to deduce the phenomena I have observed, I have hit upon a proposition, which seems natural and likely enough; and if I take it for granted, I can show that the spaces passed in natural motion are in the double proportion of the times, and consequently that the spaces passed in equal times are as the odd numbers beginning from unity, and the rest. The principle is this, that the swiftness of the moveable increases in the proportion of its distance from the point whence it began to move; as for instance,—if a heavy body drop from A towards D, by the line A B C D, I suppose the degree of velocity which it has at B to bear to the velocity at C the ratio of A B to A C. I shall be very glad if your Reverence will consider this, and tell me your opinion of it. If we admit this principle, not only, as I have said, shall we demonstrate the other conclusions, but we have it in our power to show that a body falling naturally, and another projected upwards, pass through the same degrees of velocity. For if the projectile be cast up from D to A, it is clear that at D it has force enough to reach A, and no farther; and when it has reached C and B, it is equally clear that it is still joined to a degree of force capable of carrying it to A: thus it is manifest that the forces at D, C and B decrease in the proportion of A B, A C, and A D; so that if, in falling, the degrees of velocity observe the same proportion, that is true which I have hitherto maintained and believed."

We have no means of knowing how early Galileo discovered the fallacy of this reasoning. In his Dialogues on Motion, which contain the correct theory, he has put this erroneous supposition in the mouth of Sagredo, on which Salviati remarks, "Your discourse has so much likelihood in it, that our author himself did not deny to me when I proposed it to him, that he also had been for some time in the same mistake. But that which I afterwards extremely wondered at, was to see discovered in four plain words, not only the falsity, but the impossibility of a supposition carrying with it so much of seeming truth, that although I proposed it to many, I never met with any one but did freely admit it to be so; and yet it is as false and impossible as that motion is made in an instant: for if the velocities are as the spaces passed, those spaces will be passed in equal times, and consequently all motion must be instantaneous." The following manner of putting this reasoning will perhaps make the conclusion clearer. The velocity at any point is the space that would be passed in the next moment of time, if the motion be supposed to continue the same as at that point. At the beginning of the time, when the body is at rest, the motion is none; and therefore, on this theory, the space passed in the next moment is none, and thus it will be seen that the body cannot begin to move according to the supposed law.

A curious fact, noticed by Guido Grandi in his commentary on Galileo's Dialogues on Motion, is that this false law of acceleration is precisely that which would make a circular arc the shortest line of descent between two given points; and although in general Galileo only declared that the fall down the arc is made in less time than down the chord (in which he is quite correct), yet in some places he seems to assert that the circular arc is absolutely the shortest line of descent, which is not true. It has been thought possible that the law, which on reflection he perceived to be impossible, might have originally recommended itself to him from his perception that it satisfied his prejudice in this respect.

John Bernouilli, one of the first mathematicians in Europe at the beginning of the last century, has given us a proof that such a reason might impose even on a strong understanding, in the following argument urged by him in favour of Galileo's second and correct theory, that the spaces vary as the squares of the times. He had been investigating the curve of swiftest descent, and found it to be a cycloid, the same curve in which Huyghens had already proved that all oscillations are made in accurately equal times. "I think it," says he, "worthy of remark that this identity only occurs on Galileo's supposition, so that this alone might lead us to presume it to be the real law of nature. For nature, which always does everything in the very simplest manner, thus makes one line do double work, whereas on any other supposition, we must have had two lines, one for equal oscillations, the other for the shortest descent."*

Venturi mentions a letter addressed to Galileo in May 1609 by Luca Valerio, thanking him for his experiments on the descent of bodies on inclined planes. His method of making these experiments is detailed in the Dialogues on Motion:—"In a rule, or rather plank of wood, about twelve yards long, half a yard broad one way, and three inches the other, we made upon the narrow side or edge a groove of little more than an inch wide: we cut it very straight, and, to make it very smooth and sleek, we glued upon it a piece of vellum, polished and smoothed as exactly as possible, and in that we let fall a very hard, round, and smooth brass ball, raising one of the ends of the plank a yard or two at pleasure above the horizontal plane. We observed, in the manner that I shall tell you presently, the time which it spent in running down, and repeated the same observation again and again to assure ourselves of the time, in which we never found any difference, no, not so much as the tenth part of one beat of the pulse. Having made and settled this experiment, we let the same ball descend through a fourth part only of the length of the groove, and found the measured time to be exactly half the former. Continuing our experiments with other portions of the length, comparing the fall through the whole with the fall through half, two-thirds, three-fourths, in short, with the fall through any part, we found by many hundred experiments that the spaces passed over were as the squares of the times, and that this was the case in all inclinations of the plank; during which, we also remarked that the times of descent, on different inclinations, observe accurately the proportion assigned to them farther on, and demonstrated by our author. As to the estimation of the time, we hung up a great bucket full of water, which by a very small hole pierced in the bottom squirted out a fine thread of water, which we caught in a small glass during the whole time of the different descents: then weighing from time to time, in an exact pair of scales, the quantity of water caught in this way, the differences and proportions of their weights gave the differences and proportions of the times; and this with such exactness that, as I said before, although the experiments were repeated again and again, they never differed in any degree worth noticing." In order to get rid of the friction, Galileo afterwards substituted experiments with the pendulum; but with all his care he erred very widely in his determination of the space through which a body would fall in 1″, if the resistance of the air and all other impediments were removed. He fixed it at 4 *braccia:* Mersenne has engraved the length of the '*braccia*' used by Galileo, in his "Harmonie Universelle," from which it appears to be about 23½ English inches, so that Galileo's result is rather less than eight feet. Mersenne's own result from direct observation was thirteen feet: he also made experiments in St. Peter's at Rome, with a pendulum 325 feet long, the vibrations of which were made in 10″; from this the fall in 1″ might have been deduced rather more than sixteen feet, which is very close to the truth.

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* Joh. Bernouilli, Opera Omnia, Lausannæ, 1744, tom. i. p. 192.

From another letter also written in the early part of 1609, we learn that Galileo was then busied with examining the strength and resistance "of beams of different sizes and forms, and how much weaker they are in the middle than at the ends, and how much greater weight they can support laid along their whole length, than if sustained on a single point, and of what form they should be so as to be equally strong throughout." He was also speculating on the motion of projectiles, and had satisfied himself that their motion in a vertical direction is unaffected by their horizontal velocity; a conclusion which, combined with his other experiments, led him afterwards to determine the path of a projectile in a non-resisting medium to be parabolical.

Tartalea is supposed to have been the first to remark that no bullet moves in a horizontal line; but his theory beyond this point was very erroneous, for he supposed the bullet's path through the air to be made up of an ascending and descending straight line, connected in the middle by a circular arc.

Thomas Digges, in his treatise on the Newe Science of Great Artillerie, came much nearer the truth; for he remarked*, that "The bullet violentlye throwne out of the peece by the furie of the poulder hath two motions: the one violent, which endeuoreth to carry the bullet right out in his line diagonall, according to the direction of the peece's axis, from whence the violent motion proceedeth; the other naturall in the bullet itselfe, which endeuoreth still to carrye the same directlye downeward by a right line perpendiculare to the horizon, and which dooth though insensiblye euen from the beginning by little and little drawe it from that direct and diagonall course." And a little farther he observes that "These middle curve arkes of the bullet's circuite, compounded of the violent and naturall motions of the bullet, albeit they be indeed mere helicall, yet have they a very great resemblance of the Arkes Conical. And in randons above 45° they doe much resemble the Hyperbole, and in all vnder the Ellepsis. But exactlye they neuer accorde, being indeed Spirall mixte and Helicall."

Perhaps Digges deserves no greater credit from this latter passage than the praise of a sharp and accurate eye, for he does not appear to have founded this determination of the form of the curve on any theory of the direct fall of bodies; but Galileo's arrival at the same result was preceded, as we have seen, by a careful examination of the simplest phenomena into which this compound motion may be resolved. But it is time to proceed to the analysis of his "Dialogues on Motion," these preliminary remarks on their subject matter having been merely intended to show how long before their publication Galileo was in possession of the principal theories contained in them.

Descartes, in one of his letters to Mersenne, insinuates that Galileo had taken many things in these Dialogues from him: the two which he especially instances are the isochronism of the pendulum, and the law of the spaces varying as the squares of the times.[*] Descartes was born in 1596: we have shown that Galileo observed the isochronism of the pendulum in 1583, and knew the law of the spaces in 1604, although he was then attempting to deduce it from an erroneous principle. As Descartes on more than one occasion has been made to usurp the credit due to Galileo, (in no instance more glaringly so than when he has been absurdly styled the forerunner of Newton,) it will not be misplaced to mention a few of his opinions on these subjects, recorded in his letters to Mersenne in the collection of his letters just cited:—"I am astonished at what you tell me of having found by experiment that bodies thrown up in the air take neither more nor less time to rise than to fall again; and you will excuse me if I say that I look upon the experiment as a very difficult one to make accurately. This proportion of increase according to the odd numbers 1, 3, 5, 7, &c., which is in Galileo, and which I think I wrote to you some time back, cannot be true, as I believe I intimated at the same time, unless we make two or three suppositions which are entirely false. One is Galileo's opinion, that motion increases gradually from the slowest degree; and the other is, that the air makes no resistance." In a later letter to the same person he says, apparently with some uneasiness, "I have been revising my notes on Galileo, in which I have not said expressly, that falling bodies do not pass through every degree of slowness, but I said that this cannot be determined without knowing what weight is; *which comes to the same thing*. As to your example, I grant that it proves that every degree of velocity is infinitely divisible, but not that a falling body actually passes through all these divisions.—It is certain that a stone is not equally disposed to receive a new motion or increase of velocity, when it is already moving very quickly, and when it is moving slowly. But I believe that I am now able to determine in what proportion the velocity of a stone increases, not when falling in a vacuum, but in this substantial atmosphere.—However I have now got my mind full of other things, and I cannot amuse myself with hunting this out, *nor is it a matter of much utility*." He afterwards returns once more to the same subject:—"As to what Galileo says, that falling bodies pass through every degree of velocity, I do not believe that it generally happens, but I allow it is not impossible that it may happen occasionally." After this the reader will know what value to attach to the following assertion by the same Descartes:—"I see nothing in Galileo's books to envy him, and hardly any thing which I would own as mine;" and then may judge how far Salusbury's blunt declaration is borne out, "Where or when did any one appear that durst enter the lists with our Galileus? save only one bold and unfortunate Frenchman, who yet no sooner came within the ring but he was hissed out again."[*]

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* Pantométria, 1591.

The principal merit of Descartes must undoubtedly be derived from the great advances he made in what are generally termed Abstract or Pure Mathematics; nor was he slow to point out to Mersenne and his other friends the acknowledged inferiority of Galileo to himself in this respect. We have not sufficient proof that this difference would have existed if Galileo's attention had been equally directed to that object; the singular elegance of some of his geometrical constructions indicates great talent for this as well as for his own more favourite speculations. But he was far more profitably employed: geometry and pure mathematics already far outstripped any useful application of their results to physical science, and it was the business of Galileo's life to bring up the latter to the same level. He found abstract theorems already demonstrated in sufficient number for his purpose, nor was there occasion to task his genius in search of new methods of inquiry, till all was exhausted which could be learned from those already in use. The result of his labours was that in the age immediately succeeding Galileo, the study of nature was no longer in arrear of the abstract theories of number and measure; and when the genius of Newton pressed it forward to a still higher degree of perfection, it became necessary to discover at the same time more powerful instruments of investigation. This alternating process has been successfully continued to the present time; the analyst acts as the pioneer of the naturalist, so that the abstract researches, which at first have no value but in the eyes of those to whom an elegant formula, in its own beauty, is a source of pleasure as real and as refined as a painting or a statue, are often found to furnish the only means for penetrating into the most intricate and concealed phenomena of natural philosophy.

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[*] Lettres de Descartes. Paris, 1657.

[*] Math. Coll. vol. ii.

Descartes and Delambre agree in suspecting that Galileo preferred the dialogistic form for his treatises, because it afforded a ready opportunity for him to praise his own inventions: the reason which he himself gave is, the greater facility for introducing new matter and collateral inquiries, such as he seldom failed to add each time that he reperused his work. We shall select in the first place enough to show the extent of his knowledge on the principal subject, motion, and shall then allude as well as our limits will allow to the various other points incidentally brought forward.

The dialogues are between the same speakers as in the "System of the World;" and in the first Simplicio gives Aristotle's proof,* that motion in a vacuum is impossible, because according to him bodies move with velocities in the compound proportion of their weights and the rarities of the mediums through which they move. And since the density of a vacuum bears no assignable ratio to that of any medium in which motion has been observed, any body which should employ time in moving through the latter, would pass through the same distance in a vacuum instantaneously, which is impossible. Salviati replies by denying the axioms, and asserts that if a cannon ball weighing 200 lbs., and a musket ball weighing half a pound, be dropped together from a tower 200 yards high, the former will not anticipate the latter by so much as a foot; "and I would not have you do as some are wont, who fasten upon some saying of mine that may want a hair's breadth of the truth, and under this hair they seek to hide another man's blunder as big as a cable. Aristotle says that an iron ball weighing 100 lbs. will fall from the height of 100 yards while a weight of one pound falls but one yard: I say they will reach the ground together. They find the bigger to anticipate the less by two inches, and under these two inches they seek to hide Aristotle's 99 yards." In the course of his reply to this argument Salviati formally announces the principle which is the foundation of the whole of Galileo's theory of motion, and which must therefore be quoted in his own words:—"A heavy body has by nature an intrinsic principle of moving towards the common centre of heavy things; that is to say, to the centre of our terrestrial globe, with a motion continually accelerated in such manner that in equal times there are always equal additions of velocity. This is to be understood as holding true only when all accidental and external impediments are removed, amongst which is one that we cannot obviate, namely, the resistance of the medium. This opposes itself, less or more, accordingly as it is to open more slowly or hastily to make way for the moveable, which being by its own nature, as I have said, continually accelerated, consequently encounters a continually increasing resistance in the medium, until at last the velocity reaches that degree, and the resistance that power, that they balance each other; all further acceleration is prevented, and the moveable continues ever after with an uniform and equable motion." That such a limiting velocity is not greater than some which may be exhibited may be proved as Galileo suggested by firing a bullet upwards, which will in its descent strike the ground with less force than it would have done if immediately from the mouth of the gun; for he argued that the degree of velocity which the air's resistance is capable of diminishing must be greater than that which could ever be reached by a body falling naturally from rest. "I do not think the present occasion a fit one for examining the cause of this acceleration of natural motion, on which the opinions of philosophers are much divided; some referring it to the approach towards the centre, some to the continual diminution of that part of the medium remaining to be divided, some to a certain extrusion of the ambient medium, which uniting again behind the moveable presses and hurries it forwards. All these fancies, with others of the like sort, we might spend our time in examining, and with little to gain by resolving them. It is enough for our author at present that we understand his object to be the investigation and examination of some phenomena of a motion so accelerated, (no matter what may be the cause,) that the momenta of velocity, from the beginning to move from rest, increase in the simple proportion in which the time increases, which is as much as to say, that in equal times are equal additions of velocity. And if it shall turn out that the phenomena demonstrated on this supposition are verified in the motion of falling and naturally accelerated weights, we may thence conclude that the assumed definition does describe the motion of heavy bodies, and that it is true that their acceleration varies in the ratio of the time of motion."

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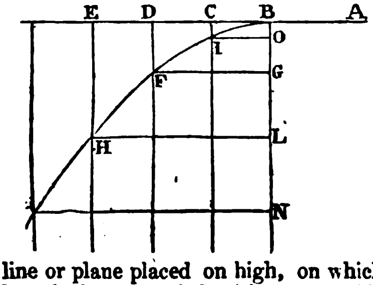
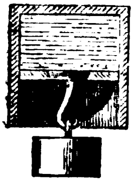
* Phys. Lib. iv. c. 8.

When Galileo first published these Dialogues on Motion, he was obliged to rest his demonstrations upon another principle besides, namely, that the velocity acquired in falling down all inclined planes of the same perpendicular height is the same. As this result was derived directly from experiment, and from that only, his theory was so far imperfect till he could show its consistency with the above supposed law of acceleration. When Viviani was studying with Galileo, he expressed his dissatisfaction at this chasm in the reasoning; the consequence of which was, that Galileo, as he lay the same night, sleepless through indisposition, discovered the proof which he had long sought in vain, and introduced it into the subsequent editions. The third dialogue is principally taken up with theorems on the direct fall of bodies, their times of descent down differently inclined planes, which in planes of the same height he determined to be as the lengths, and with other inquiries connected with the same subject, such as the straight lines of shortest descent under different data, &c.

The fourth dialogue is appropriated to projectile motion, determined upon the principle that the horizontal motion will continue the same as if there were no vertical motion, and the vertical motion as if there were no horizontal motion. "Let A B represent a horizontal line or plane placed on high, on which let a body be carried with an equable motion from A towards B, and the support of the plane being taken away at B, let the natural motion downwards due to the body's weight come upon it in the direction of the perpendicular B N. Moreover let the straight line B E drawn in the direction A B be taken to represent the flow, or measure, of the time, on which let any number of equal parts B C, C D, D E, &c. be marked at pleasure, and from the points C, D, E, let lines be drawn parallel to B N; in the first of these let any part C I be taken, and let D F be taken four times as great as C I, E H nine times as great, and so on, proportionally to the squares of the lines B C, B D, B E, &c., or, as we say, in the double proportion of these lines. Now if we suppose that whilst by its equable horizontal motion the body moves from B to C, it also descends by its weight through C I, at the end of the time denoted by B C it will be at I. Moreover in the time B D, double of B C, it will have fallen four times as far, for in the first part of the Treatise it has been shewn that the spaces fallen through by a heavy body vary as the squares of the times. Similarly at the end of the time B E, or three times B C, it will have fallen through E H, and will be at H. And it is plain that the points I, F, H, are in the same parabolical line B I F H. The same demonstration will apply if we take any number of equal particles of time of whatever duration."



The curve called here a Parabola by Galileo, is one of those which results from cutting straight through a Cone, and therefore is called also one of the Conic Sections, the curious properties of which curves had drawn the attention of geometricians long before Galileo thus began to point out their intimate connexion with the phenomena of motion. After the proposition we have just extracted, he proceeds to anticipate some objections to the theory, and explains that the course of a projectile will not be accurately a parabola for two reasons; partly on account of the resistance of the air, and partly because a horizontal line, or one equidistant from the earth's centre, is not straight, but circular. The latter cause of difference will, however, as he says, be insensible in all such experiments as we are able to make. The rest of the Dialogue is taken up with different constructions for determining the circumstances of the motion of projectiles, as their range, greatest height, &c.; and it is proved that, with a given force of projection, the range will be greatest when a ball is projected at an elevation of 45°, the ranges of all angles equally inclined above and below 45° corresponding exactly to each other.



One of the most interesting subjects discussed in these dialogues is the famous notion of Nature's horror of a vacuum or empty space, which the old school of philosophy considered as impossible to be obtained. Galileo's notions of it were very different; for although he still unadvisedly adhered to the old phrase to denote the resistance experienced in endeavouring to separate two smooth surfaces, he was so far from looking upon a vacuum as an impossibility, that he has described an apparatus by which he endeavoured to measure the force necessary to produce one. This consisted of a cylinder, into which is tightly fitted a piston; through the centre of the piston passes a rod with a conical valve, which, when drawn down, shuts the aperture closely, supporting a basket. The space between the piston and cylinder being filled full of water poured in through the aperture, the valve is closed, the vessel reversed, and weights are added till the piston is drawn forcibly downwards. Galileo concluded that the weight of the piston, rod, and added weights, would be the measure of the force of resistance to the vacuum which he supposed would take place between the piston and lower surface of the water. The defects in this apparatus for the purpose intended are of no consequence, so far as regards the present argument, and it is perhaps needless to observe that he was mistaken in supposing the water would not descend with the piston. This experiment occasions a remark from Sagredo, that he had observed that a lifting-pump would not work when the water in the cistern had sunk to the depth of thirty-five feet below the valve; that he thought the pump was injured, and sent for the maker of it, who assured him that no pump upon that construction would lift water from so great a depth. This story is sometimes told of Galileo, as if he had said sneeringly on this occasion that Nature's horror of a vacuum does not extend beyond thirty-five feet; but it is very plain that if he had made such an observation, it would have been seriously; and in fact by such a limitation he deprived the notion of the principal part of its absurdity. He evidently had adopted the common notion of suction, for he compares the column of water to a rod of metal suspended from its upper end, which may be lengthened till it breaks with its own weight. It is certainly very extraordinary that he failed to observe how simply these phenomena may be explained by a reference to the weight of the elastic atmosphere, which he was perfectly well acquainted with, and endeavoured by the following ingenious experiment to determine:—"Take a large glass flask with a bent neck, and round its mouth tie a leathern pipe with a valve in it, through which water may be forced into the flask with a syringe without suffering any air to escape, so that it will be compressed within the bottle. It will be found difficult to force in more than about three-fourths of what the flask will hold, which must be carefully weighed. The valve must then be opened, and just so much air will rush out as would in its natural density occupy the space now filled by the water. Weigh the vessel again; the difference will show the weight of that quantity of air*." By these means, which the modern experimentalist will see were scarcely capable of much accuracy, Galileo found that air was four hundred times lighter than water, instead of ten times, which was the proportion fixed on by Aristotle. The real proportion is about 830 times.

The true theory of the rise of water in a lifting-pump is commonly dated from Torricelli's famous experiment with a column of mercury, in 1644, when he found that the greatest height at which it would stand is fourteen times less than the height at which water will stand, which is exactly the proportion of weight between water and mercury. The following curious letter from Baliani, in 1630, shows that the original merit of suggesting the real cause belongs to him, and renders it still more unaccountable that Galileo, to whom it was addressed, should not at once have adopted the same view of the subject:—"I have believed that a vacuum may exist naturally ever since I knew that the air has sensible weight, and that you taught me in one of your letters how to find its weight exactly, though I have not yet succeeded with that experiment. From that moment I took up the notion that it is not repugnant to the nature of things that there should be a vacuum, but merely that it is difficult to produce. To explain myself more clearly: if we allow that the air has weight, there is no difference between air and water except in degree. At the bottom of the sea the weight of the water above me compresses everything round my body, and it strikes me that the same thing must happen in the air, we being placed at the bottom of its immensity; we do not feel its weight, nor the compression round us, because our bodies are made capable of supporting it. But if we were in a vacuum, then the weight of the air above our heads would be felt. It would be felt very great, but not infinite, and therefore determinable, and it might be overcome by a force proportioned to it. In fact I estimate it to be such that, to make a vacuum, I believe we require a force greater than that of a column of water thirty feet high[*]."

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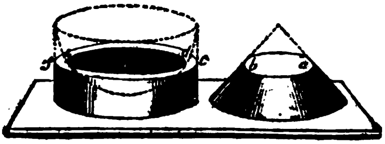
* It has been recently proposed to determine the density of high-pressure steam by a process analogous to this.

This subject is introduced by some observations on the force of cohesion, Galileo seeming to be of opinion that, although it cannot be adequately accounted for by "the great and principal resistance to a vacuum, yet that perhaps a sufficient cause may be found by considering every body as composed of very minute particles, between every two of which is exerted a similar resistance." This remark serves to lead to a discussion on indivisibles and infinite quantities, of which we shall merely extract what Galileo gives as a curious paradox suggested in the course of it. He supposes a basin to be formed by scooping a hemisphere out of a cylinder, and a cone to be taken of the same depth and base as the hemisphere. It is easy to show, if the cone and scooped cylinder be both supposed to be cut by the same plane, parallel to the one on which both stand, that the area of the ring C D E F thus discovered in the cylinder is equal to the area of the corresponding circular section AB of the cone, wherever the cutting plane is supposed to be[*]. He then proceeds with these remarkable words:—"If we raise the plane higher and higher, one of these areas terminates in the circumference of a circle, and the other in a point, for such are the upper rim of the basin and the top of the cone. Now since in the diminution of the two areas they to the very last maintain their equality to one another, it is in my thoughts proper to say that the highest and ultimate terms[†] of such diminutions are equal, and not one infinitely bigger than the other. It seems therefore that the circumference of a large circle may be said to be equal to one single point. And why may not these be called equal if they be the last remainders and vestiges left by equal magnitudes[‡]?"



We think no one can refuse to admit the probability, that Newton may have found in such passages as these the first germ of the idea of his prime and ultimate ratios, which afterwards became in his hands an instrument of such power. As to the paradoxical result, Descartes undoubtedly has given the true answer to it in saying that it only proves that the line is not a greater area than the point is. Whilst on this subject, it may not be uninteresting to remark that something similar to the doctrine of fluxions seems to have been lying dormant in the minds of the mathematicians of Galileo's era, for Inchoffer illustrates his argument in the treatise we have already mentioned, that the Copernicans may deduce some true results from what he terms their absurd hypothesis, by observing, that mathematicians may deduce the truth that a line is length without breadth, from the false and physically impossible supposition that a point flows, and that a line is the fluxion of a point[§].

A suggestion that perhaps fire dissolves bodies by insinuating itself between their minute particles, brings on the subject of the violent effects of heat and light; on which Sagredo inquires, whether we are to take for granted that the effect of light does or does not require time. Simplicio is ready with an answer, that the discharge of artillery proves the transmission of light to be instantaneous, to which Sagredo cautiously replies, that nothing can be gathered from that experiment except that light travels more swiftly than sound; nor can we draw any decisive conclusion from the rising of the sun. "Who can assure us that he is not in the horizon before his rays reach our sight?" Salviati then mentions an experiment by which he endeavoured to examine this question. Two observers are each to be furnished with a lantern: as soon as the first shades his light, the second is to discover his, and this is to be repeated at a short distance till the observers are perfect in the practice. The same thing is to be tried at the distance of several miles, and if the first observer perceive any delay between shading his own light and the appearance of his companion's, it is to be attributed to the time taken by the light in traversing twice the distance between them. He allows that he could discover no perceptible interval at the distance of a mile, at which he had tried the experiment, but recommends that with the help of a telescope it should be tried at much greater distances. Sir Kenelm Digby remarks on this passage: "It may be objected (if there be some observable tardity in the motion of light) that the sunne would never be truly in that place in which unto our eyes he appeareth to be; because that it being seene by means of the light which issueth from it, if that light required time to move in, the sunne (whose motion is so swifte) would be removed from the place where the light left it, before it could be with us to give tidings of him. To this I answer, allowing peradventure that it may be so, who knoweth the contrary? Or what inconvenience would follow if it be admitted * ?"

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[*] Venturi, vol. ii.

[*] Galileo also reasons in the same way on the equality of the solids standing on the cutting plane, but one is sufficient for our present purpose.

[†] Gli altissimi e ultimi termini.

[‡] Le ultime reliquie e vestigie lasciate da grandezze eguali.

[§] Punctum fluere, et lineam esse fluxum puncti. Tract. Syllept. Romæ, 1633.

The principal thing remaining to be noticed is the application of the theory of the pendulum to musical concords and dissonances, which are explained, in the same manner as by Kepler in his "Harmonices Mundi," to result from the concurrence or opposition of vibrations in the air striking upon the drum of the ear. It is suggested that these vibrations may be made manifest by rubbing the finger round a glass set in a large vessel of water; "and if by pressure the note is suddenly made to rise to the octave above, every one of the undulations which will be seen regularly spreading round the glass, will suddenly split into two, proving that the vibrations that occasion the octave are double those belonging to the simple note." Galileo then describes a method he discovered by accident of measuring the length of these waves more accurately than can be done in the agitated water. He was scraping a brass plate with an iron chisel, to take out some spots, and moving the tool rapidly upon the plate, he occasionally heard a hissing and whistling sound, very shrill and audible, and whenever this occurred, and then only, he observed the light dust on the plate to arrange itself in a long row of small parallel streaks equidistant from each other. In repeated experiments he produced different tones by scraping with greater or less velocity, and remarked that the streaks produced by the acute sounds stood closer together than those from the low notes. Among the sounds produced were two, which by comparison with a viol he ascertained to differ by an exact fifth; and measuring the spaces occupied by the streaks in both experiments, he found thirty of the one equal to forty-five of the other, which is exactly the known proportion of the lengths of strings of the same material which sound a fifth to each other *.

Salviati also remarks, that if the material be not the same, as for instance if it be required to sound an octave to a note on catgut, on a wire of the same length, the weight of the wire must be made four times as great, and so for other intervals. "The immediate cause of the forms of musical intervals is neither the length, the tension, nor the thickness, but the proportion of the numbers of the undulations of the air which strike upon the drum of the ear, and make it vibrate in the same intervals. Hence we may gather a plausible reason of the different sensations occasioned to us by different couples of sounds, of which we hear some with great pleasure, some with less, and call them accordingly concords, more or less perfect, whilst some excite in us great dissatisfaction, and are called discords. The disagreeable sensation belonging to the latter

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* "Treatise of the Nature of Bodies. London, 1665."

* This beautiful experiment is more easily tried by drawing the bow of a violin across the edge of glass strewed with fine dry sand. Those who wish to see more on the subject may consult Chladni's 'Acoustique.'

probably arises from the disorderly manner in which the vibrations strike the drum of the ear; so that for instance a most cruel discord would be produced by sounding together two strings, of which the lengths are to each other as the side and diagonal of a square, which is the discord of the false fifth. On the contrary, agreeable consonances will result from those strings of which the numbers of vibrations made in the same time are commensurable, "to the end that the cartilage of the drum may not undergo the incessant torture of a double inflexion from the disagreeing percussions." Something similar may be exhibited to the eye by hanging up pendulums of different lengths: "if these be proportioned so that the times of their vibrations correspond with those of the musical concords, the eye will observe with pleasure their crossings and interweavings still recurring at appreciable intervals; but if the times of vibration be incommensurate, the eye will be wearied and worn out with following them."

The second dialogue is occupied entirely with an investigation of the strength of beams, a subject which does not appear to have been examined by any one before Galileo beyond Aristotle's remark, that long beams are weaker, because they are at once the weight, the lever, and the fulcrum; and it is in the development of this observation that the whole theory consists. The principle assumed by Galileo as the basis of his inquiries is, that the force of cohesion with which a beam resists a cross fracture in any section may all be considered as acting at the centre of gravity of the section, and that it breaks always at the lowest point: from this he deduced that the effect of the weight of a prismatic beam in overcoming the resistance of one end by which it is fastened to a wall, varies directly as the square of the length, and inversely as the side of the base. From this it immediately follows, that if for instance the bone of a large animal be three times as long as the corresponding one in a smaller beast, it must be nine times as thick to have the same strength, provided we suppose in both cases that the materials are of the same consistence. An elegant result which Galileo also deduced from this theory, is that the form of such a beam, to be equally strong in every part, should be that of a parabolical prism, the vertex of the parabola being the farthest removed from the wall. As an easy mode of describing the parabolic curve for this purpose, he recommends tracing the line in which a heavy flexible string hangs. This curve is not an accurate parabola: it is now called a catenary; but it is plain from the description of it in the fourth dialogue, that Galileo was perfectly aware that this construction is only approximately true. In the same place he makes the remark, which to many is so paradoxical, that no force, however great, exerted in a horizontal direction, can stretch a heavy thread, however slender, into an accurately straight line.

The fifth and sixth dialogues were left unfinished, and annexed to the former ones by Viviani after Galileo's death: the fragment of the fifth, which is on the subject of Euclid's Definition of Ratio, was at first intended to have formed a part of the third, and followed the first proposition on equable motion: the sixth was intended to have embodied Galileo's researches on the nature and laws of Percussion, on which he was employed at the time of his death. Considering these solely as fragments, we shall not here make any extracts from them.

CHAPTER XVIII.

Correspondence on Longitudes.—Pendulum Clock.

In the spring of 1636, having finished his Dialogues on Motion, Galileo resumed the plan of determining the longitude by means of Jupiter's satellites. Perhaps he suspected something of the private intrigue which thwarted his former expectations from the Spanish government, and this may have induced him on the present occasion to negotiate the matter without applying for Ferdinand's assistance and recommendation. Accordingly he addressed himself to Lorenz Real, who had been Governor General of the Dutch possessions in India, freely and unconditionally offering the use of his theory to the States General of Holland. Not long before, his opinion had been requested by the commissioners appointed at Paris to examine and report on the practicability of another method proposed by Morin,* which consisted in observing the distance of the moon from a known star. Morin was a French philosopher, principally known as an astrologer and zealous Anti-Copernican; but his name deserves to be recorded as undoubtedly one of the first to recommend a method, which, under the name of a Lunar distance, is now in universal practice.

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* One of the Commissioners was the father of Blaise Pascal.

The monthly motion of the moon is so rapid, that her distance from a given star sensibly varies in a few minutes even to the unassisted eye; and with the aid of the telescope, we can of course appreciate the change more accurately. Morin proposed that the distances of the moon from a number of fixed stars lying near her path in the heavens should be beforehand calculated and registered for every day in the year, at a certain hour, in the place from which the longitudes were to be reckoned, as for instance at Paris. Just as in the case of the eclipses of Jupiter's satellites, the observer, when he saw that the moon had arrived at the registered distance, would know the hour at Paris: he might also make allowance for intermediate distances. Observing at the same instant the hour on board his ship, the difference between the two would show his position in regard of longitude. In using this method as it is now practised, several modifications are to be attended to, without which it would be wholly useless, in consequence of the refraction of the atmosphere, and the proximity of the moon to the earth. Owing to the latter cause, if two spectators should at the same instant of time, but in different places, measure the distance of the moon in the East, from a star still more to the eastward, it would appear greater to the more easterly spectator than to the other observer, who as seen from the star would be standing more directly behind the moon. The mode of allowing for these alterations is taught by trigonometry and astronomy.

The success of this method depends altogether upon the exact knowledge which we now have of the moon's course, and till that knowledge was perfected it would have been found altogether illusory. Such in fact was the judgment which Galileo pronounced upon it. "As to Morin's book on the method of finding the longitude by means of the moon's motion, I say freely that I conceive this idea to be as accurate in theory, as fallacious and impossible in practice. I am sure that neither you nor any one of the other four gentlemen can doubt the possibility of finding the difference of longitude between two meridians by means of the moon's motion, provided we are sure of the following requisites: First, an Ephemeris of the moon's motion exactly calculated for the first meridian from which the others are to be reckoned; secondly, exact instruments, and convenient to handle, in taking the distance between the moon and a fixed star; thirdly, great practical skill in the observer; fourthly, not less accuracy in the scientific calculations, and astronomical computations; fifthly, very perfect clocks to number the hours, or other means of knowing them exactly, &c. Supposing, I say, all these elements free from error, the longitude will be accurately found; but I reckon it more easy and likely to err in all of these together, than to be practically right in one alone. Morin ought to require his judges to assign, at their pleasure, eight or ten moments of different nights during four or six months to come, and pledge himself to predict and assign by his calculations the distances of the moon at those determined instants from some star which would then be near her. If it is found that the distances assigned by him agree with those which the quadrant or sextant* will actually show, the judges would be satisfied of his success, or rather of the truth of the matter, and nothing would remain but to show that his operations were such as could be performed by men of moderate skill, and also practicable at sea as well as on land. I incline much to think that an experiment of this kind would do much towards abating the opinion and conceit which Morin has of himself, which appears to me so lofty, that I should consider myself the eighth sage, if I knew the half of what Morin presumes to know."

It is probable that Galileo was biassed by a predilection for his own method, on which he had expended so much time and labour; but the objections which he raises against Morin's proposal in the foregoing letter are no other than those to which at that period it was undoubtedly open. With regard to his own, he had already, in 1612, given a rough prediction of the course of Jupiter's satellites, which had been found to agree tolerably well with subsequent observations; and since that time, amid all his other employments, he had almost unintermittingly during twenty-four years continued his observations, for the sake of bringing the tables of their motions to as high a state of perfection as possible. This was the point to which the inquiries of the States in their answer to Galileo's frank proposal were principally directed. They immediately appointed commissioners to communicate with him, and report the various points on which they required information. They also sent him a golden chain, and assured him that in the case of the design proving successful, he should have no cause to complain of their want of gratitude and generosity. The commissioners immediately commenced an active correspondence with him, in the course of which he entered into more minute details with regard to the methods by which he proposed to obviate the practical difficulties of the necessary observations.

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* These instruments were very inferior to those now in use under the same name. See "Treatise on Opt. Instrum."

It is worth noticing that the secretary to the Prince of Orange, who was mainly instrumental in forming this commission, was Constantine Huyghens, father of the celebrated mathematician of that name, of whom it has been said that he seemed destined to complete the discoveries of Galileo; and it is not a little remarkable, that Huyghens nowhere in his published works makes any allusion to this connexion between his father and Galileo, not even during the discussion that arose some years later on the subject of the pendulum clock, which must necessarily have forced it upon his recollection.

The Dutch commissioners had chosen one of their number to go into Italy for the purpose of communicating personally with Galileo, but he discouraged this scheme, from a fear of its giving umbrage at Rome. The correspondence being carried on at so great a distance necessarily experienced many tedious delays, till in the very midst of Galileo's labours to complete his tables, he was seized with the blindness which we have already mentioned. He then resolved to place all the papers containing his observations and calculations for this purpose in the hands of Renieri, a former pupil of his, and then professor of mathematics at Pisa, who undertook to finish and to forward them into Holland. Before this was done, a new delay was occasioned by the deaths which speedily followed each other of every one of the four commissioners; and for two or three years the correspondence with Holland was entirely interrupted. Constantine Huyghens, who was capable of appreciating the value of the scheme, succeeded after some trouble in renewing it, but only just before the death of Galileo himself, by which of course it was a second time broken off; and to complete the singular series of obstacles by which the trial of this method was impeded, just as Renieri, by order of the Duke of Tuscany, was about to publish the ephemeris and tables which Galileo had entrusted to him, and which the Duke told Viviani he had seen in his possession, he also was attacked with a mortal malady; and upon his death the manuscripts were nowhere to be found, nor has it since been discovered what became of them. Montucla has intimated his suspicions that Renieri himself destroyed them, from a consciousness that they were insufficient for the purpose to which it was intended to apply them; a bold conjecture, and one which ought to rest upon something more than mere surmise: for although it may be considered certain, that the practical value of these tables would be very inconsiderable in the present advanced state of knowledge, yet it is nearly as sure that they were unique at that time, and Renieri was aware of the value which Galileo himself had set upon them, and should not be lightly accused of betraying his trust in so gross a manner. In 1665, Borelli calculated the places of the satellites for every day in the ensuing year, which he professed to have deduced (by desire of the Grand Duke) from Galileo's tables;* but he does not say whether or not these tables were the same that had been in Renieri's possession.

We have delayed till this opportunity to examine how far the invention of the pendulum clock belongs to Galileo. It has been asserted that the isochronism of the pendulum had been noticed by Leonardo da Vinci, but the passage on which this assertion is founded (as translated from his manuscripts by Venturi) scarcely warrants this conclusion. "A rod which engages itself in the opposite teeth of a spur-wheel can act like the arm of the balance in clocks, that is to say, it will act alternately, first on one side of the wheel, then on the opposite one, without interruption." If Da Vinci had constructed a clock on this principle, and recognized the superiority of the pendulum over the old balance, he would surely have done more than merely mention it as affording an unintermitted motion "like the arm of the balance." The use of the balance is supposed to have been introduced at least as early as the fourteenth century. Venturi mentions the drawing and description of a clock in one of the manuscripts of the King's Library at Paris, dated about the middle of the fifteenth century, which as he says nearly resembles a modern watch. The balance is there called "The circle fastened to the stem of the pallets, and moved by the force with it.* In that singularly wild and extravagant book, entitled "A History of both Worlds," by Robert Flud, are given two drawings of the wheel-work of the clocks and watches in use before the application of the pendulum. An inspection of them will show how little remained to be done when the isochronism of the pendulum was discovered. *Fig.* 1. represents "the large clocks moved by a weight, such as are put up in churches and turrets; *fig.* 2. the small ones moved by a spring, such as are worn round the neck, or placed on a shelf or table. The use of the chain is to equalize the spring, which is strongest at the beginning of its motion."* This contrivance of the chain is mentioned by Cardan, in 1570, and is probably still older. In both figures the name given to the cross bar, with the weight attached to it, is "the time or balance (*tempus seu libratio*) by which the motion is equalized." The manner in which Huyghens first applied the pendulum is shown in *fig.* 3.† The action in the old clocks of the balance, or *rake*, as it was also called, was by checking the motion of the descending weight till its inertia was overcome; it was then forced round till the opposite pallet engaged in the toothed wheel. The balance was thus suddenly and forcibly reduced to a state of rest, and again set in motion in the opposite direction. It will be observed that these balances wanted the spiral spring introduced in all modern watches, which has a property of isochronism similar to that of the pendulum. Hooke is generally named as the discoverer of this property of springs, and as the author of its application to the improvement of watches, but the invention is disputed with him by Huyghens. Lahire asserts‡ that the isochronism of springs was communicated to Huyghens at Paris by Hautefeuille, and that this was the reason why Huyghens failed to obtain the patent he solicited for the construction of spring watches. A great number of curious contrivances at this early period in the history of Horology, may be seen in Schott's Magia Naturæ, published at Nuremberg in 1664.

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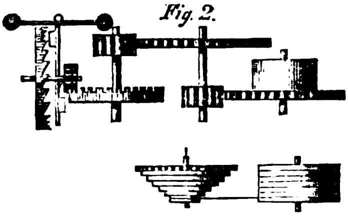
* Theoricæ Mediceorum Planetarum. Florentiæ, 1666.

Fig. 2.



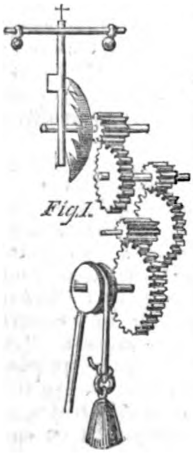


Fig.1.

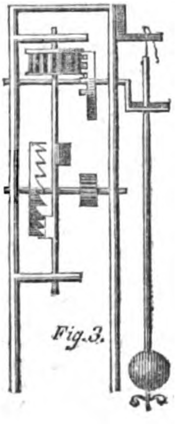


Fig.3.

Galileo was early convinced of the importance of his pendulum to the accuracy of astronomical observations; but the progress of invention is such that the steps which on looking back seem the easiest to make, are often those which are the longest delayed. Galileo recognized the principle of the isochronism of the pendulum, and recommended it as a measurer of time in 1583; yet fifty years later, although constantly using it, he had not devised a more convenient method of doing so, than is contained in the following description taken from his "Astronomical Operations."

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* Circulus affixus virgæ paletorum qui cum eâ de vi movetur.

* Utriusque Cosmi Historia. Oppenhemii, 1617.

† Huygenii Opera. Lugduni, 1724.

‡ Mémoires de l'Academie, 1717.

"A very exact time-measurer for minute intervals of time, is a heavy pendulum of any size hanged by a fine thread, which, if removed from the perpendicular and allowed to swing freely, always completes its vibrations, be they great or small, in exactly the same time."*

The mode of finding exactly by means of this the quantity of any time reduced to hours, minutes, seconds, &c., which are the divisions commonly used among astronomers, is this:—"Fit up a pendulum of any length, as for instance about a foot long, and count patiently (only for once) the number of vibrations during a natural day. Our object will be attained if we know the exact revolution of the natural day. The observer must then fix a telescope in the direction of any star, and continue to watch it till it disappears from the field of view. At that instant he must begin to count the vibrations of the pendulum, continuing all night and the following day till the return of the same star within the field of view of the telescope, and its second disappearance, as on the first night. Bearing in recollection the total number of vibrations thus made in twenty-four hours, the time corresponding to any other number of vibrations will be immediately given by the Golden Rule."

A second extract out of Galileo's Dutch correspondence, in 1637, will show the extent of his improvements at that time:—"I come now to the second contrivance for increasing immensely the exactness of astronomical observations. I allude to my time-measurer, the precision of which is so great, and such, that it will give the exact quantity of hours, minutes, seconds, and even thirds, if their recurrence could be counted; and its constancy is such that two, four, or six such instruments will go on together so equably that one will not differ from another so much as the beat of a pulse, not only in an hour, but even in a day or a month."—"I do not make use of a weight hanging by a thread, but a heavy and solid pendulum, made for instance of brass or copper, in the shape of a circular sector of twelve or fifteen degrees, the radius of which may be two or three palms, and the greater it is the less trouble will there be in attending it. This sector, such as I have described, I make thickest in the middle radius, tapering gradually towards the edges, where I terminate it in a tolerably sharp line, to obviate as much as possible the resistance of the air, which is the sole cause of its retardation."—[These last words deserve notice, because, in a previous discussion, Galileo had observed that the parts of the pendulum nearest the point of suspension have a tendency to vibrate quicker than those at the other end, and seems to have thought erroneously that the stoppage of the pendulum is partly to be attributed to this cause.]—"This is pierced in the centre, through which is passed an iron bar shaped like those on which steelyards hang, terminated below in an angle, and placed on two bronze supports, that they may wear away less during a long motion of the sector. If the sector (when accurately balanced) be removed several degrees from its perpendicular position, it will continue a reciprocal motion through a very great number of vibrations before it will stop; and in order that it may continue its motion as long as is wanted, the attendant must occasionally give it a smart push, to carry it back to large vibrations." Galileo then describes as before the method of counting the vibrations in the course of a day, and gives the rule that the lengths of two similar pendulums will have the same proportion as the squares of their times of vibration. He then continues: "Now to save the fatigue of the assistant in continually counting the vibrations, this is a convenient contrivance: A very small and delicate needle extends out from the middle of the circumference of the sector, which in passing strikes a rod fixed at one end; this rod rests upon the teeth of a wheel as light as paper, placed in a horizontal plane near the pendulum, having round it teeth cut like those of a saw, that is to say, with one side of each tooth perpendicular to the rim of the wheel and the other inclined obliquely. The rod striking against the perpendicular side of the tooth moves it, but as the same rod returns against the oblique side, it does not move it the contrary way, but slips over it and falls at the foot of the following tooth, so that the motion of the wheel will be always in the same direction. And by counting the teeth you may see at will the number of teeth passed, and consequently the number of vibrations and of particles of time elapsed. You may also fit to the axis of this first wheel a second, with a small number of teeth, touching another greater toothed wheel, &c. But it is superfluous to point out this to you, who have by you men very ingenious and well skilled in making clocks and other admirable machines; and on this new principle, that the pendulum makes its great and small vibrations in the same time exactly, they will invent contrivances more subtle than any I can suggest; and as the error of clocks consists principally in the disability of workmen hitherto to adjust what we call the balance of the clock, so that it may vibrate regularly, my very simple pendulum, which is not liable to any alteration, affords a mean of maintaining the measures of time always equal." The contrivance thus described would be somewhat similar to the annexed representation, but it is almost certain that no such instrument was actually constructed.

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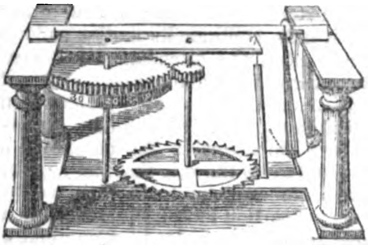
* See page 84.



It must be owned that Galileo greatly overrated the accuracy of his timekeeper; and in asserting so positively that which he had certainly not experienced, he seems to depart from his own principles of philosophizing. It will be remarked that in this passage he still is of the erroneous opinion, that all the vibrations great or small of the same pendulum take exactly the same time; and we have not been able to find any trace of his having ever held a different opinion, unless perhaps in the Dialogues, where he says, "If the vibrations are not exactly equal, they are at least insensibly different." This is very much at variance with the statement in the Memoirs of the Academia del Cimento, edited by their secretary Magalotti, on the credit of which Galileo's claim to the pendulum-clock chiefly rests. It is there said that experience shows that the smallest vibrations are rather the quickest, "as Galileo announced after the observation, which in 1583 he was the first to make of their approximate equality." It is not possible immediately in connexion with so glaring a misstatement, to give implicit credence to the assertion in the next sentence, that "*to obviate this inconvenience*" Galileo was the first to contrive a clock, constructed in 1649, by his son Vincenzo, in which, by the action of a weight or spring, the pendulum was constrained to move always from the same height. Indeed it appears as if Magalotti did not always tell this story in the same manner, for he is referred to as the author of the account given by Becher, "that Galileo himself made a pendulum-clock one of which was sent to Holland," plainly insinuating that Huyghens was a mere copyist.* These two accounts therefore serve to invalidate each other's credibility. Tiraboschi† asserts that, at the time he wrote, the mathematical professor at Pisa was in possession of the identical clock constructed by Treffler under Vincenzo's directions; and quotes a letter from Campani, to whom it was shown by Ferdinand, "old, rusty, and unfinished as Galileo's son made it before 1649." Viviani on the other hand says that Treffler constructed this same clock some time after Vincenzo's death (which happened in 1649), on a different principle from Vincenzo's ideas, although he says distinctly that he heard Galileo describe an application of the pendulum to a clock similar to Huyghens' contrivance. Campani did not actually see this clock till 1659, which was three years after Huyghens' invention, so that perhaps Huyghens was too easily satisfied when, on occasion of the answer which Ferdinand sent to his complaints of the Memorie del Cimento he wrote to Bouillaud, "I must however believe, since such a prince assures me, that Galileo had this idea before me."

There is another circumstance almost amounting to a proof that it was an afterthought to attribute the merit of constructing the pendulum-clock to Galileo, for on the reverse of a medal struck by Viviani, and inscribed "to the memory of his excellent instructor,"‡ is a rude exhibition of the principal objects to which Galileo's attention was directed. The pendulum is represented simply by a weight attached to a string hanging on the face of a rock. It is probable that, in a design expressly intended to commemorate Galileo's inventions, Viviani would have introduced the timekeeper in the most perfect form to which it had been brought by him. Riccioli,[*] whose industry was unwearied in collecting every fact and argument which related in any way to the astronomical and mechanical knowledge and opinions of his time, expressly recommends swinging a pendulum, or perpendicular as it was often called (only a few years before Huyghens' publication), as much more accurate *than any clock*.[†] Join to all these arguments Huyghens' positive assertion, that if Galileo had conceived any such idea, he at least was entirely ignorant of it,[‡] and no doubt can remain that the merit of the original invention (such as it was) rests entirely with Huyghens. The step indeed seems simple enough for a less genius than his: for the property of the pendulum was known, and the conversion of a rotatory into a reciprocating motion was known; but the connexion of the one with the other having been so long delayed, we must suppose that difficulties existed where we are not now able to perceive them, for Huyghens' improvement was received with universal admiration.

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* De nova Temporis dimetiendi ratione. Londini, 1680.

† Storia della Lett. Ital.

‡ Museum Mazuchellianum, vol. ii. Tab. cvii. p. 29.

There may be many who will consider the pendulum as undeserving so long a discussion; who do not know or remember that the telescope itself has hardly done more for the precision of astronomical observations than this simple instrument, not to mention the invaluable convenience of an uniform and accurate timekeeper in the daily intercourse of life. The patience and industry of modern observers are often the theme of well-merited praise, but we must look with a still higher degree of wonder on such men as Tycho-Brahe and his contemporaries, who were driven by the want of any timekeeper on which they could depend to the most laborious expedients, and who nevertheless persevered to the best of their ability, undisgusted either by the tedium of such processes, or by the discouraging consciousness of the necessary imperfection of their most approved methods and instruments.

The invariable regularity of the pendulum's motion was soon made subservient to ulterior purposes beyond that of merely registering time. We have seen the important assistance it afforded in establishing the laws of motion; and when the theory founded on those laws was extended and improved, the pendulum was again instrumental, by a species of approximate reasoning familiar to all who are acquainted with physical inquiries, in pointing out by its minute irregularities in different parts of the earth, a corresponding change in the weight of all bodies in those different situations, supposed to be the consequence of a greater distance from the axis of the earth's rotation; since that would occasion the force of attraction to be counterbalanced by an increased centrifugal force. The theory which kept pace with the constantly increasing accuracy of such observations, proving consistent in all trials of it, has left little room for future doubts; and in this manner the pendulum in intelligent hands became the simplest instrument for ascertaining the form of the globe which we inhabit. An English astronomer, who corresponded with Kepler under the signature of Brutius (whose real name perhaps might be Bruce), had already declared his belief in 1603, that "the earth on which we tread is neither round nor globular, but more nearly of an oval figure."[*] There is nothing to guide us to the grounds on which he formed this opinion, which was perhaps only a lucky guess. Kepler's note upon it is: "This is not altogether to be contemned."

A farther use of the pendulum is in furnishing a general and unperishing standard of measure. This application is suggested in the third volume of the 'Reflections' of Mersenne, published in 1647, where he observes that it may be best for the future not to divide time into hours, minutes, and seconds, but to express its parts by the number of vibrations of a pendulum of given length, swinging through a given arc. It was soon seen that it would be more convenient to invert this process, and to choose as an unit of length the pendulum which should make a certain number of vibrations in the unit of time, naturally determined by the revolution of the earth on its axis. Our Royal Society took an active part in these experiments, which seem, notwithstanding their utility, to have met from the first with much of the same ridicule which was lavished upon them by the ignorant, when recently repeated for the same purpose. "I contend," says Graunt[*] in a dedication to the Royal Society, dated 1662, "against the envious schismatics of your society (who think you do nothing unless you presently transmute metals, make butter and cheese without milk, and, as their own ballad hath it, make leather without hides), by asserting the usefulness of even all your preparatory and luciferous experiments, being not the ceremonies, but the substance and principles of useful arts. For I find in trade the want of an universal measure, and have heard musicians wrangle about the just and uniform keeping of time in their consorts, and therefore cannot with patience hear that your labours about vibrations, eminently conducing to both, should be slighted, nor your pendula called swing-swangs with scorn."[†]

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[*] Almagestum Novum, vol. i.

[†] Quovis horologio accuratius.

[‡] Clarorum Belgarum ad Ant. Magliabech. Epistolæ. Florence, 1745, tom. i. p. 235.

[*] Kepleri Epistolæ.

CHAPTER XIX.

Character of Galileo—Miscellaneous details—his Death—Conclusion.

THE remaining years of Galileo's life were spent at Arcetri, where indeed, even if the Inquisition had granted his liberty, his increasing age and infirmities would probably have detained him. The rigid caution with which he had been watched in Florence was in great measure relaxed, and he was permitted to see the friends who crowded round him to express their respect and sympathy. The Grand Duke visited him frequently, and many distinguished strangers, such as Gassendi and Deodati, came into Italy solely for the purpose of testifying their admiration of his character. Among other visitors the name of Milton will be read with interest: we may probably refer to the effects of this interview the allusions to Galileo's discoveries, so frequently introduced into his poem. Milton mentions in his 'Areopagitica,' that he saw Galileo whilst in Italy, but enters into no details of his visit.

Galileo was fond of society, and his cheerful and popular manners rendered him an universal favourite among those who were admitted to his intimacy. Among these, Viviani, who formed one of his family during the three last years of his life, deserves particular notice, on account of the strong attachment and almost filial veneration with which he ever regarded his master and benefactor. His long life, which was prolonged to the completion of his 81st year in 1703, enabled him to see the triumphant establishment of the truths on account of which Galileo had endured so many insults; and even in his old age, when in his turn he had acquired a claim to the reverence of a younger generation, our Royal Society, who invited him among them in 1696, felt that the complimentary language in which they addressed him as the first mathematician of the age would have been incomplete and unsatisfactory without an allusion to the friendship that gained him the cherished title of "The last pupil of Galileo."[*]

Torricelli, another of Galileo's most celebrated followers, became a member of his family in October, 1641: he first learned mathematics from Castelli, and occasionally lectured for him at Rome, in which manner he was employed when Galileo, who had seen his book 'On Motion,' and augured the greatest success from such a beginning, invited him to his house—an offer which Torricelli eagerly embraced, although he enjoyed the advantages of it but for a short time. He afterwards succeeded Galileo in his situation at the court of Florence,[†] but survived him only a few years.

It is from the accounts of Viviani and Gherardini that we principally draw the following particulars of Galileo's person and character:—Signor Galileo was of a cheerful and pleasant countenance, especially in his old age, square built, and well proportioned in stature, and rather above the middle size. His complexion was fair and sanguine, his eyes brilliant, and his hair of a reddish cast. His constitution was naturally strong, but worn out by fatigue of mind and body, so as frequently to be reduced to a state of the utmost weakness. He was subject to attacks of hypochondria, and often molested by severe and dangerous illnesses, occasioned in great measure by his sleepless nights, the whole of which he frequently spent in astronomical observations. During upwards of forty-eight years of his life, he was tormented with acute rheumatic pains, suffering particularly on any change of weather. He found himself most free from these pains whilst residing in the country, of which consequently he became very fond: besides, he used to say that in the country he had greater freedom to read the book of Nature, which lay there open before him. His library was very small, but well chosen, and open to the use of the friends whom he loved to see assembled round him, and whom he was accustomed to receive in the most hospitable manner. He ate sparingly himself; but was particularly choice in the selection of his wines, which in the latter part of his life were regularly supplied out of the Grand Duke's cellars. This taste gave an additional stimulus to his agricultural pursuits, and many of his leisure hours were spent in the cultivation and superintendence of his vineyards. It should seem that he was considered a good judge of wine; for Viviani has preserved one of his receipts in a collection of miscellaneous experiments. In it he strongly recommends that for wine of the first quality, that juice only should be employed, which is pressed out by the mere weight of the heaped grapes, which would probably be that of the ripest fruit. The following letter, written in his 74th year, is dated, "From my prison at Arcetri.—I am forced to avail myself of your assistance and favour, agreeably to your obliging offers, in consequence of the excessive chill of the weather, and of old age, and from having drained out my grand stock of a hundred bottles, which I laid in two years ago; not to mention some minor particulars during the last two months, which I received from my Serene Master, the Most Eminent Lord Cardinal, their Highnesses the Princes, and the Most Excellent Duke of Guise, besides cleaning out two barrels of the wine of this country. Now, I beg that with all due diligence and industry, and with consideration, and taking counsel with the most refined palates, you will provide me with two cases, that is to say, with forty flasks of different wines, the most exquisite that you can find: take no thought of the expense, because I stint myself so much in all other pleasures that I can afford to lay out something at the request of Bacchus, without giving offence to his two companions Ceres and Venus. You must be careful to leave out neither Scillo nor Carino (I believe they meant to call them Scylla and Charybdis), nor the country of my master, Archimedes of Syracuse, nor Greek wines, nor clarets, &c. &c. The expense I shall easily be able to satisfy, but not the infinite obligation."

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[*] Natural and Political Observations. London, 1665.

[†] See also Hudibras, Part II. Cant. III.

They're guilty by their own confessions
Of felony, and at the Sessions
Upon the bench I will so handle 'em,
That the vibration of this pendulum
Shall make all taylors' yards of one
Unanimous opinion;
A thing he long has vaunted of,
But now shall make it out of proof.

Hudibras was certainly written before 1663: ten years later Huyghens speaks of the idea of so employing the pendulum as a common one.

[*] The words of his diploma are: Galilæi in mathematicis disciplinis discipulus, in ærumnis socius, Italicum ingenium ita perpolivit optimis artibus ut inter mathematicos sæculi nostri facile princeps per orbem litterarium numeretur.—Tiraboschi.

[†] On this occasion the taste of the time showed itself in the following anagram:—

Evangelista Torricellieus,
En virescit Galilæus alter.

In his expenditure Galileo observed a just mean between avarice and profusion: he spared no cost necessary for the success of his many and various experiments, and spent large sums in charity and hospitality, and in assisting those in whom he discovered excellence in any art or profession, many of whom he maintained in his own house. His temper was easily ruffled, but still more easily pacified. He seldom conversed on mathematical or philosophical topics except among his intimate friends; and when such subjects were abruptly brought before him, as was often the case by the numberless visitors he was in the habit of receiving, he showed great readiness in turning the conversation into more popular channels, in such manner however that he often contrived to introduce something to satisfy the curiosity of the inquirers. His memory was uncommonly tenacious, and stored with a vast variety of old songs and stories, which he was in the constant habit of quoting and alluding to. His favourite Italian authors were Ariosto, Petrarca, and Berni, great part of whose poems he was able to repeat. His excessive admiration of Ariosto determined the side which he took against Tasso in the virulent and unnecessary controversy which has divided Italy so long on the respective merits of these two great poets; and he was accustomed to say that reading Tasso after Ariosto was like tasting cucumbers after melons. When quite a youth, he wrote a great number of critical remarks on Tasso's Gerusalemme Liberata, which one of his friends borrowed, and forgot to return. For a long time it was thought that the manuscript had perished, till the Abbé Serassi discovered it, whilst collecting materials for his Life of Tasso, published at Rome in 1785. Serassi being a violent partizan of Tasso, but also unwilling to lose the credit of the discovery, copied the manuscript, but without any intention of publishing it, "till he could find leisure for replying properly to the sophistical and unfounded attacks of a critic so celebrated on other accounts." He announced his discovery as having been made "in one of the famous libraries at Rome," which vague indication he with some reason considered insufficient to lead to a second discovery. On Serassi's death his copy was found, containing a reference to the situation of the original; the criticisms were published, and form the greatest part of the last volume of the Milan edition of Galileo's works. The manuscript was imperfect at the time of this second discovery, several leaves having been torn out, it is not known by whom.

The opinion of the most judicious Italian critics appears to be, that it would have been more for Galileo's credit if these remarks had never been made public: they are written in a spirit of flippant violence, such as might not be extraordinary in a common juvenile critic, but which it is painful to notice from the pen of Galileo. Two or three sonnets are extant written by Galileo himself, and in two instances he has not scrupled to appropriate the conceits of the poet he affected to undervalue.[*] It should be mentioned that Galileo's matured taste rather receded from the violence of his early prejudices, for at a later period of his life he used to shun comparing the two; and when forced to give an opinion he said, "that Tasso's appeared the finer poem, but that Ariosto gave him the greater pleasure." Besides these sonnets, there is extant a short burlesque poem written by him, "In abuse of Gowns," when, on his first becoming Professor at Pisa, he found himself obliged by custom to wear his professional habit in every company. It is written not without humour, but does not bear comparison with Berni, whom he imitated.

There are several detached subjects treated of by Galileo, which may be noticed in this place. A letter by him containing the solution of a problem in Chances is probably the earliest notice extant of the application of mathematics to that interesting subject: the correspondence between Pascal and Fermat, with which its history is generally made to begin, not having taken place till at least twelve years later. There can be little doubt after the clear account of Carlo Dati, that Galileo was the first to examine the curve called the Cycloid, described by a point in the rim of a wheel rolling on a straight line, which he recommended as a graceful form for the arch of a bridge at Pisa. He even divined that the area contained between it and its base is exactly three times that of the generating circle. He seems to have been unable to verify this guess by strict geometrical reasoning, for Viviani tells an odd story, that in order to satisfy his doubts he cut out several large cycloids of pasteboard, but finding the weight in every trial to be rather less than three times that of the circle, he suspected the proportion to be irrational, and that there was some error in his estimation; the inquiry he abandoned was afterwards resumed with success by his pupil Torricelli.[*]

The account which Lagalla gives of an experiment shown in his presence by Galileo, carries the observation of the phosphorescence of the Bologna stone at least as far back as 1612.[†] Other writers mention the name of an alchymist, who according to them discovered it accidentally in 1603. Cesi, Lagalla, and one or two others, had passed the night at Galileo's house, with the intention of observing Venus and Saturn; but, the night being cloudy, the conversation turned on other matters, and especially on the nature of light, "on which Galileo took a small wooden box at daybreak before sunrise, and showed us some small stones in it, desiring us to observe that they were not in the least degree luminous. Having then exposed them for some time to the twilight, he shut the window again; and in the midst of the dark room showed us the stones, shining and glistening with a faint light, which we saw presently decay and become extinguished." In 1640, Liceti attempted to refer the effect of the earthshine upon the moon to a similar phosphorescent quality of that luminary, to which Galileo, then aged 76, replied by a long and able letter, enforcing the true explanation he had formerly given.

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[*] Compare Son. ii. v. 8 & 9; and Son. iii. v. 2 & 3, with Ger. Lib. c. iv. st. 76, and c. vii. st. 19.—The author gladly owns his obligation for these remarks to the kindness of Sig. Paniazi, Professor of Italian in the University of London.

[*] Lettera di Timauro Antiate. Firenze, 1663.

[†] De phænomenis in orbe Lunæ. Venetiis, 1612.

Although quite blind, and nearly deaf, the intellectual powers of Galileo remained to the end of his life; but he occasionally felt that he was overworking himself, and used to complain to his friend Micanzio that he found his head too busy for his body. " I cannot keep my restless brain from grinding on, although with great loss of time; for whatever idea comes into my head with respect to any novelty, drives out of it whatever I had been thinking of just before." He was busily engaged in considering the nature of the force of percussion, and Torricelli was employed in arranging his investigations for a continuation of the 'Dialogues on Motion,' when he was seized with an attack of fever and palpitation of the heart, which, after an illness of two months, put an end to his long, laborious, and useful life, on the 8th of January, 1642, just one year before his great successor Newton was born.

The malice of his enemies was scarcely allayed by his death. His right of making a will was disputed, as having died a prisoner to the Inquisition, as well as his right to burial in consecrated ground. These were at last conceded, but Urban anxiously interfered to prevent the design of erecting a monument to him in the church of Santa Croce, in Florence, for which a large sum had been subscribed. His body was accordingly buried in an obscure corner of the church, which for upwards of thirty years after his death was unmarked even by an inscription to his memory. It was not till a century later that the splendid monument was erected which now covers his and Viviani's remains. When their bodies were disinterred in 1737 for the purpose of being removed to their new resting-place, Capponi, the president of the Florentine Academy, in a spirit of spurious admiration, mutilated Galileo's body, by removing the thumb and forefinger of the right-hand, and one of the vertebræ of the back, which are still preserved in some of the Italian museums. The monument was put up at the expense of his biographer, Nelli, to whom Viviani's property descended, charged with the condition of erecting it. Nor was this the only public testimony which Viviani gave of his attachment. The medal which he struck in honour of Galileo has already been mentioned; he also, as soon as it was safe to do so, covered every side of the house in which he lived with laudatory inscriptions to the same effect. A bust of Galileo was placed over the door, and two bas-reliefs on each side representing some of his principal discoveries. Not less than five other medals were struck in honour of him during his residence at Padua and Florence, which are all engraved in Venturi's Memoirs.

There are several good portraits of Galileo extant, two of which, by Titi and Subtermanns, are engraved in Nelli's Life of Galileo. Another by Subtermanns is in the Florentine Gallery, and an engraving from a copy of this is given by Venturi. There is also a very fine engraving from the original picture. An engraving from another original picture is in the frontispiece of the Padua edition of his works. Salusbury seems in the following passage to describe a portrait of Galileo painted by himself: " He did not contemn the other inferior arts, for he had a good hand in sculpture and carving; but his particular care was to paint well. By the pencil he described what his telescope discovered; in one he exceeded art, in the other, nature. Osorius, the eloquent bishop of Sylva, esteems one piece of Mendoza the wise Spanish minister's felicity, to have been this, that he was contemporary to Titian, and that by his hand he was drawn in a fair tablet. And Galilæus, lest he should want the same good fortune, made so great a progress in this curious art, that he became his own *Buonarota;* and because there was no other copy worthy of his pencil, drew himself." No other author makes the slightest allusion to such a painting; and it appears more likely that Salusbury should be mistaken than that so interesting a portrait should have been entirely lost sight of.

Galileo's house at Arcetri was standing in 1821, when Venturi visited it, and found it in the same state in which Galileo might be supposed to have left it. It is situated nearly a mile from Florence, on the south-eastern side, and about a gun-shot to the north-west of the convent of St. Matthew. Nelli placed a suitable inscription over the door of the house, which belonged in 1821 to a Signor Alimari.*

Although Nelli's Life of Galileo disappointed the expectations that had been formed of it, it is impossible for any admirer of Galileo not to feel the greatest degree of gratitude towards him, for the successful activity with which he rescued so many records of the illustrious philosopher from destruction. After Galileo's death, the principal part of his books, manuscripts, and instruments, were put into the charge of Viviani, who was himself at that time an object of great suspicion; most of them he thought it prudent to conceal, till the superstitious outcries against Galileo should be silenced. At Viviani's death, he left his library, containing a very complete collection of the works of all the mathematicians who had preceded him (and amongst them those of Galileo, Torricelli, and Castelli, all which were enriched with notes and additions by himself), to the hospital of St. Mary at Florence, where an extensive library already existed. The directors of the hospital sold this unique collection in 1781, when it became entirely dispersed. The manuscripts in Viviani's possession passed to his nephew, the Abbé Panzanini, together with the portraits of the chief personages of the Galilean school, Galileo's instruments, and, among other curiosities, the emerald ring which he wore as a member of the Lyncean Academy. A great number of these books and manuscripts were purchased at different times by Nelli, after the death of Panzanini, from his relations, who were ignorant or regardless of their value. One of his chief acquisitions was made by an extraordinary accident, related by Tozzetti with the following details, which we repeat, as they seem to authenticate the story:—"In the spring of 1739, the famous Doctor Lami went out according to his custom to breakfast with some of his friends at the inn of the Bridge, by the starting-place; and as he and Sig. Nelli were passing through the market, it occurred to them to buy some Bologna sausages from the pork-butcher, Cioci, who was supposed to excel in making them. They went into the shop, had their sausages cut off and rolled in paper, which Nelli put into his hat. On reaching the inn, and calling for a plate to put them in, Nelli observed that the paper in which they had been rolled was one of Galileo's letters. He cleaned it as well as he could with his napkin, and put it into his pocket without saying a word to Lami; and as soon as he returned into the city, and could get clear of him, he flew to the shop of Cioci, who told him that a servant whom he did not know brought him from time to time similar letters, which he bought by weight as waste paper. Nelli bought all that remained, and on the servant's next reappearance in a few days, he learned the quarter whence they came, and after some time succeeded at a small expense in getting into his own possession an old corn-chest, containing all that still remained of the precious treasures which Viviani had concealed in it ninety years before."*

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* Venturi.

The earliest biographical notice of Galileo is that in the Obituary of the Mercurio Italico, published at Venice in 1647, by Vittorio Siri. It is very short, but contains an exact enumeration of his principal works and discoveries. Rossi, who wrote under the name of Janus Nicius Erythræus, introduced an account of Galileo in his Pinacotheca Imaginum Illustrium, in which the story of his illegitimacy first made its appearance. In 1664, Salusbury published a life of Galileo in the second volume of his Mathematical Collections, the greater part of which is a translation of Galileo's principal works. Almost the whole edition of the second volume of Salusbury's book was burnt in the great fire of London. Chauffepié says that only one copy is known to be extant in England: this is now in the well-known library of the Earl of Macclesfield, to whose kindness the author is much indebted for the use he has been allowed to make of this unique volume. A fragment of this second volume is in the Bodleian Library at Oxford. The translations in the preceding pages are mostly founded upon Salusbury's version. Salusbury's account, although that of an enthusiastic admirer of Galileo, is too prolix to be interesting: the general style of the performance may be guessed from the title of the first chapter—'Of Man in general, and how he excelleth all the other Animals.' After informing his readers that Galileo was born at Pisa, he proceeds:—"Italy is affirmed to have been the first that peopled the world after the universal deluge, being governed by Janus, Cameses, and Saturn, &c." His description of Galileo's childhood is somewhat quaint. "Before others had left making of dirt pyes, he was framing of diagrams; and whilst others were whipping of toppes, he was considering the cause of their motion." It is on the whole tolerably correct, especially if we take into account that Salusbury had not yet seen Viviani's Life, though composed some years earlier.

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* Notizie sul Ingrandimento delle Scienze Fisiche. Firenze, 1780.

The Life of Galileo by Viviani was first written as an outline of an intended larger work, but this latter was never completed. This sketch was published in the Memoirs of the Florentine Academy, of which Galileo had been one of the annual presidents, and afterwards prefixed to the complete editions of Galileo's works; it is written in a very agreeable and flowing style, and has been the groundwork of most subsequent accounts. Another original memoir by Niccolò Gherardini, was published by Tozzetti. A great number of references to authors who have treated of Galileo is given by Sach in his Onomasticon. An approved Latin memoir by Brenna is in the first volume of Fabroni's Vitæ Italorum Illustrium; he has however fallen into several errors: this same work contains the lives of several of his principal followers.

The article in Chauffepié's Continuation of Bayle's Dictionary does not contain anything which is not in the earlier accounts.

Andrès wrote an essay entitled 'Saggio sulla Filosofia del Galileo,' published at Mantua 1776; and Jagemann published his 'Geschichte des Leben des Galileo' at Leipzig, in 1787;* neither of these the author has been able to meet with. An analysis of the latter may be seen in Kästner's 'Geschichte der Mathematik, Göttingen, 1800,' from which it does not appear to contain any additional details. The 'Elogio del Galileo' by Paolo Frisi, first published at Leghorn in 1775, is, as its title expresses, rather in the nature of a panegyric than of a continuous biographical account. It is written with very great elegance and intimate knowledge of the subjects of which it treats. Nelli gave several curious particulars with respect to Galileo in his 'Saggio di Storia Letteraria Fiorentina, Lucca, 1759;' and in 1793 published his large work entitled 'Vita e Commercio Letterario di Galileo Galilei.' So uninteresting a book was probably never written from such excellent materials. Two thick quarto volumes are filled with repetitions of the accounts that were already in print, the bulky preparation of which compelled the author to forego the publication of the vast collection of original documents which his unwearied zeal and industry had collected. This defect has been in great measure supplied by Venturi in 1818 and 1821, who has not only incorporated in his work many of Nelli's manuscripts, but has brought together a number of scattered notices of Galileo and his writings from a variety of outlying sources—a service which the writer is able to appreciate from having gone through the greatest part of the same labour before he was fortunate enough to meet with Venturi's book. Still there are many letters cited by Nelli, which do not appear either in his book or Venturi's. Carlo Dati, in 1663, quotes "the registers of Galileo's correspondence arranged in alphabetical order, in ten large volumes."* The writer has no means of ascertaining what collection this may have been; it is difficult to suppose that one so arranged should have been lost sight of. It is understood that a life of Galileo is preparing at this moment in Florence, by desire of the present Grand Duke, which will probably throw much additional light on the character and merits of this great and useful philosopher.

The first editions of his various treatises, as mentioned by Nelli, are given below. Clement, in his 'Bibliothèque Curieuse,' has pointed out such among them, and the many others which have been printed, as have become rare.

The Florentine edition is the one used by the Academia della Crusca for their references; for which reason its paging is marked in the margin of the edition of Padua, which is much more complete, and is the one which has been on the present occasion principally consulted.

The latter contains the Dialogue on the System, which was not suffered to be printed in the former editions. The twelve first volumes of the last edition of Milan are a mere transcript of that of Padua: the thirteenth contains in addition the Letter to the Grand Duchess, the Commentary on Tasso, with some minor pieces. A complete edition is still wanted, embodying all the recently discovered documents, and omitting the verbose commentaries, which, however useful when they were written, now convey little information that cannot be more agreeably and more profitably learned in treatises of a later date.

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* Venturi.

* Lettera di Timauro Antiate.

Such was the life, and such were the pursuits, of this extraordinary man. The numberless inventions of his acute industry; the use of the telescope, and the brilliant discoveries to which it led; the patient investigation of the laws of weight and motion; must all be looked upon as forming but a part of his real merits, as merely particular demonstrations of the spirit in which he everywhere withstood the despotism of ignorance, and appealed boldly from traditional opinions to the judgments of reason and common sense. He claimed and bequeathed to us the right of exercising our faculties in examining the beautiful creation which surrounds us. Idolized by his friends, he deserved their affection by numberless acts of kindness; by his good humour, his affability, and by the benevolent generosity with which he devoted himself and a great part of his limited income to advance their talents and fortunes. If an intense desire of being useful is everywhere worthy of honour; if its value is immeasurably increased, when united to genius of the highest order; if we feel for one who, notwithstanding such titles to regard, is harassed by cruel persecution,—then none deserve our sympathy, our admiration, and our gratitude, more than Galileo.

List of Galileo's Works.

Le Operazioni del Compasso Geom. e Milit.	Padova,	1606.	Fol.
Difesa di Gal. Galilei contr. all. cal. et impost. di Bald. Capra	Venezza,	1607.	4to.
Sydereus Nuncius	Venetiis,	1610.	4to.
Discorso int. alle cose che stanno in su l'Acqua	Firenze,	1612.	4to.
Novantiqua SS. PP. Doctrina de S. Scripturæ Testimoniis	Argent,	1612.	4to.
Istoria e Demostr. int. alle Macchie Solari	Roma,	1613.	4to.
Risp. alle oppos. del S. Lod. delle Colombe e del S. Vinc. di Grazia	Firenze,	1615.	4to.
Discorso delle Comete di Mario Guiducci	Firenze,	1619.	4to.
Dialogo sopra i due Massimi Sistemi del Mondo	Firenze,	1632.	4to.
Discorso e Demostr. intorno alle due nuove Scienze	Leida,	1638.	4to.
Della Scienza Meccanica	Ravenna,	1649.	4to.
Trattato della Sfera	Roma,	1655.	4to.
Discorso sopra il Flusso e Reflusso. (Scienze Fisiche di Tozzetti.)	Firenze,	1780.	4to.
Considerazioni sul Tasso	Roma,	1793.	
Trattato della Fortificazione. (Memorie di Venturi.)	Modena,	1818.	4to.

The editions of his collected works (in which is contained much that was never published separately) are—

Opere di Gal. Galilei, Linc. Nob. Fior. &c.	Bologna,	1656.	2 vols.	4to.
Opere di Gal. Galilei, Nob. Fior. Accad. Linc. &c.	Firenze,	1718.	3 vols.	4to.
Opere di Gal. Galilei	Padova,	1744.	4 vols.	4to.
Opere di Gal. Galilei	Milano,	1811.	13 vols.	8vo.

CORRECTIONS.

Page	*Co.*	*Line.*
5	1	2, *Add:* His instructor was the celebrated botanist, Andreas Cæsalpinus, who was professor of medicine at Pisa from 1567 to 1592. Hist. Acad. Pisan.; Pisis, 1791.
8	2	18, *Add:* According to Kästner, his German name was Wursteisen.
8	2	21, *for* 1588 *read* 1586.
15	1	57, *for* 1632 read 1630.
17	1	29. Salusbury alludes to the instrument described and figured in "The Use of the Sector, Crosse Staffe, and other Instruments. London, 1624." It is exactly Galileo's Compass.
17	1	52, *for* Burg, a German, *read* Burgi, a Swiss.
27	2	17. The author here called Brutti was an Englishman: his real name, perhaps, was Bruce. See p. 99.
50	1	14. Kepler's Epitome was not published till 1619: it was then inserted in the Index.
73	1	69, *for* under *read* turned from.
80	1	50, *for* any *read* an indefinitely small.

LIFE OF KEPLER.

Chapter I.

Introduction—Birth and Education of Kepler—He is appointed Astronomical Professor at Gratz—Publishes the 'Mysterium Cosmographicum.'

In the account of the life and discoveries of Galileo, we have endeavoured to inculcate the safety and fruitfulness of the method followed by that great reformer in his search after physical truth. As his success furnishes the best instance of the value of the inductive process, so the failures and blunders of his adversaries supply equally good examples of the dangers and the barrenness of the opposite course. The history of John Kepler might, at the first view, suggest conclusions somewhat inconsistent with this remark. Every one who is but moderately acquainted with astronomy is familiar with the discoveries which that science owes to him; the manner in which he made them is, perhaps, not so generally known. This extraordinary man pursued, almost invariably, the hypothetical method. His life was passed in speculating on the results of a few principles assumed by him, from very precarious analogies, as the causes of the phenomena actually observed in Nature. We nevertheless find that he did, in spite of this unphilosophical method, arrive at discoveries which have served as guides to some of the most valuable truths of modern science.

The difficulty will disappear if we attend more closely to the details of Kepler's investigations. We shall perceive that to an unusual degree of rashness in the formation of his systems, he added a quality very rarely possessed by philosophers of the hypothetical school. One of the greatest intellectual vices of the latter was a wilful blindness to the discrepancy of facts from their creed, a perverse and obstinate resistance to physical evidence, leading not unfrequently to an attempt at disguising the truth. From this besetting sin of the school, which from an intellectual fault often degenerated into a moral one, Kepler was absolutely free. Scheme after scheme, resting originally upon little beyond his own glowing imagination, but examined and endeared by the ceaseless labour of years, was unhesitatingly sacrificed, as soon as its insufficiency became indisputable, to make room for others as little deserving support. The history of philosophy affords no more remarkable instance of sincere uncompromising love of truth. To this virtue he owed his great discoveries: it must be attributed to his unhappy method that he made no more.

In considering this opinion upon the real nature of Kepler's title to fame, it ought not to be forgotten that he has exposed himself at a disadvantage on which certainly very few philosophers would venture. His singular candour allowed him to comment upon his own errors with the same freedom as if scrutinizing the work of a stranger; careless whether the impression on his readers were favourable or otherwise to himself, provided it was instructive. Few writers have spoken so much, and so freely of themselves, as Kepler. He records, on almost every occasion, the train of thought by which he was led to each of the discoveries that eventually repaid his perseverance; and he has thus given us a most curious and interesting view of the workings of a mind of great, though eccentric power. "In what follows," says he (when introducing a long string of suppositions, of which he had already discovered the fallacy), "let the reader pardon my credulity, whilst working out all these matters by my own ingenuity. For it is my opinion that the occasions by which men have acquired a knowledge of celestial phenomena are not less admirable than the discoveries themselves." Agreeing altogether with this opinion in its widest application, we have not scrupled, in the following sketch, to introduce at some length an account even of Kepler's erroneous speculations; they are in themselves very amusing, and will have the additional utility of proving the dangerous tendency of his method; they will show by how many absurd theories, and how many years of wasted labour, his real discoveries and services to science lie surrounded.

JOHN KEPLER was born (as we are assured by his earliest biographer Hantsch) in long. 29° 7′, lat. 48° 54′, on the 21st day of December, 1571. On this spot stands the imperial city of Weil, in the duchy of Wirtemberg. His parents were Henry Kepler and Catherine Guldenmann, both of noble, though decayed families. Henry Kepler, at the time of his marriage, was a petty officer in the Duke of Wirtemberg's service; and a few years after the birth of his eldest son John, he joined the army then serving in the Netherlands. His wife followed him, leaving their son, then in his fifth year, at Leonberg, under the care of his grandfather. He was a seven months child, very weak and sickly; and after recovering with difficulty from a severe attack of small-pox, he was sent to school in 1577. Henry Kepler's limited income was still farther reduced on his return into Germany, the following year, in consequence of the absconding of one of his acquaintance, for whom he had incautiously become surety. His circumstances were so much narrowed by this misfortune, that he was obliged to sell his house, and nearly all that he possessed, and for several years he supported his family by keeping a tavern at Elmendingen. This occasioned great interruption to young Kepler's education; he was taken from school, and employed in menial services till his twelfth year, when he was again placed in the school at Elmendingen. In the following year he was again seized with a violent illness, so that his life was almost despaired of. In 1586, he was admitted into the monastic school of Maulbronn, where the cost of his education was defrayed by the Duke of Wirtemberg. This school was one of those established on the suppression of the monasteries at the Reformation, and the usual course of education followed there required that the students, after remaining a year in the superior classes, should offer themselves for examination at the college of Tubingen for the degree of bachelor: they then returned to their school with the title of veterans; and after completing the studies taught there, they were admitted as resident students at Tubingen, proceeded in about a year to the degree of master, and were then allowed to commence their course of theology. The three years of Kepler's life following his admission to Maulbronn, were marked by periodical returns of several of the disorders which had well nigh proved fatal to him in his childhood. During the same time disagreements arose between his parents, in consequence of which his father quitted his home, and soon after died abroad. After his father's departure, his mother also quarrelled with her relations, having been treated, says Hantsch, "with a degree of barbarity by her husband and brother-in-law that was hardly exceeded even by her own perverseness:" one of his brothers died, and the family-affairs were in the greatest confusion. Notwithstanding these disadvantages, Kepler took his degree of master in August 1591, attaining the second place in the annual examination. The first name on the list was John Hippolytus Brentius.

Whilst he was thus engaged at Tubingen, the astronomical lectureship at Gratz, the chief town of Styria, became vacant by the death of George Stadt, and the situation was offered to Kepler. Of this first occasion of turning his thoughts towards astronomy, he has himself given the following account: "As soon as I was of an age to feel the charms of philosophy, I embraced every part of it with intense desire, but paid no especial regard to astronomy. I had indeed capacity enough for it, and learned without difficulty the geometrical and astronomical theorems occurring in the usual course of the school, being well grounded in figures, numbers, and proportions. But those were compulsory studies—there was nothing to show a particular turn for astronomy. I was educated at the expense of the Duke of Wirtemberg, and when I saw such of my companions as the duke selected to send abroad shrink in various ways from their employments, out of fondness for home, I, who was more callous, had early made up my mind to go with the utmost readiness whithersoever I might be sent. The first offering itself was an astronomical post, which I was in fact forced to accept by the authority of my tutors; not that I was alarmed, in the manner I had condemned in others, by the remoteness of the situation, but by the unexpected and contemptible nature of the office, and by the slightness of my information in this branch of philosophy. I entered on it, therefore, better furnished with talent than knowledge: with many protestations that I was not abandoning my claim to be provided for in some other more brilliant profession. What progress I made in the first two years of my studies, may be seen in my 'Mysterium Cosmographicum;' and the encouragement given me by my tutor, Mästlin, to take up the science of astronomy, may be read in the same book, and in his letter which is prefixed to the 'Narrative of Rheticus.' I looked on that discovery as of the highest importance, and still more so, because I saw how greatly it was approved by Mästlin."

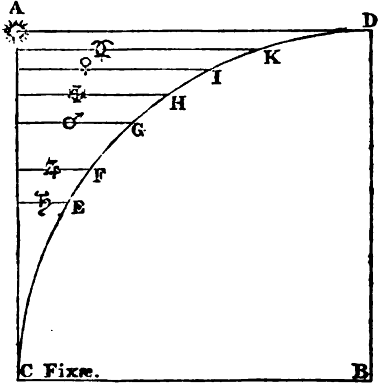
The nature of the singular work to which Kepler thus refers with so much complacency, will be best shown by quoting some of the most remarkable parts of it, and especially the preface, in which he briefly details some of the theories he successively examined and rejected, before detecting (as he imagined he had here done) the true cause of the number and order of the heavenly bodies. The other branches of philosophy with which he occupied himself in his younger years, were those treated by Scaliger in his 'Exoteric Exercises,' to the study of which book Kepler attributed the formation of many of his opinions; and he tells us that he devoted much time "to the examination of the nature of heaven, of souls, of genii, of the elements, of the essence of fire, of the cause of fountains, the ebb and flow of the tide, the shape of the continents, and inland seas, and things of this sort." He also says, that by his first success with the heavens, his hopes were greatly inflamed of discovering similar analogies in the rest of the visible world, and for this reason, named his book merely a Prodromus, or Forerunner, meaning, at some future period, to subjoin the Aftercomer, or Sequel. But this intention was never fulfilled; either his imagination failed him, or, what is more likely, the laborious calculations in which his astronomical theories engaged him, left him little time for turning his attention to objects unconnected with his first pursuit.

It is seldom that we are admitted to trace the progress of thought in those who have distinguished themselves by talent and originality; and although the whole of the following speculations begin and end in error, yet they are so characteristic, and exhibit such an extraordinary picture of the extravagances into which Kepler's lively imagination was continually hurrying him, that we cannot refrain from citing nearly the whole preface. From it, better than from any enumeration of peculiarities, the reader will at once apprehend the nature of his disposition.

"When I was attending the celebrated Mästlin, six years ago, at Tubingen, I was disturbed by the manifold inconveniences of the common theory of the universe, and so delighted with Copernicus, whom Mästlin was frequently in the habit of quoting with great respect, that I not only often defended his propositions in the physical disputations of the candidates, but also wrote a correct essay on the primary motion, maintaining, that it is caused by the rotation of the earth. And I was then at that point that I attributed to the earth the motion of the sun on physical (or, if you will, on metaphysical) grounds, as Copernicus had done for mathematical reasons. And, by this practice, I came by degrees, partly from Mästlin's instructions, and partly from my own efforts, to understand the superior mathematical convenience of the system of Copernicus beyond Ptolemy's. This labour might have been spared me, by Joachim Rheticus, who has shortly and clearly explained everything in his first Narrative. While incidentally engaged in these labours, in the intermission of my theology, it happened conveniently that I succeeded George Stadt in his situation at Gratz, where the nature of my office connected me more closely with these studies. Everything I had learned from Mästlin, or had acquired of myself, was there of great service to me in explaining the first elements of astronomy. And, as in Virgil, '*Fama mobilitate viget, viresque acquirit eundo,*' so it was with me, that the diligent thought on these things was the occasion of still further thinking: until, at last, in the year 1595, when I had some intermission of my lectures allowed me, I brooded with the whole energy of my mind on this subject. There were three things in particular, of which I pertinaciously sought the causes why they are not other than they are: the number, the size, and the motion of the orbits. I attempted the thing at first with numbers, and considered whether one of the orbits might be double, triple, quadruple, or any other multiple of the others, and how much, according to Copernicus, each differed from the rest. I spent a great deal of time in that labour, as if it were mere sport, but could find no equality either in the proportions or the differences, and I gained nothing from this beyond imprinting deeply in my memory the distances as assigned by Copernicus; unless, perhaps, reader, this record of my various attempts may force your assent, backwards and forwards, as the waves of the sea; until tired at length, you will willingly repose yourself, as in a safe haven, on the reasons explained in this book. However, I was comforted in some degree, and my hopes of success were supported as well by other reasons which will follow presently, as by observing that the motions in every case seemed to be connected with the distances, and that where there was a great gap between the orbits, there was the same between the motions. And I reasoned, that if God had adapted motions to the orbits in some relation to the distances, it was probable that he had also arrayed the distances themselves in relation to something else.

"Finding no success by this method, I tried another, of singular audacity. I inserted a new planet between Mars and Jupiter, and another between Venus and Mercury, both of which I supposed invisible, perhaps on account of their smallness, and I attributed to each a certain period of revolution.[*] I thought that I could thus contrive some equality of proportions, increasing between every two, from the sun to the fixed stars. For instance, the Earth is nearer Venus in parts of the terrestrial orbit, than Mars is to the Earth in parts of the orbit of Mars. But not even the interposition of a new planet sufficed for the enormous gap between Mars and Jupiter; for the proportion of Jupiter to the new planet was still greater than that of Saturn to Jupiter. And although, by this supposition, I got some sort of a proportion, yet there was no reasonable conclusion, no certain determination of the number of the planets either towards the fixed stars, till we should get as far as them, nor ever towards the Sun, because the division in this proportion of the residuary space within Mercury might be continued without end. Nor could I form any conjecture, from the mobility of particular numbers, why, among an infinite number, so few should be moveable. The opinion advanced by Rheticus in his Narrative is improbable, where he reasons from the sanctity of the number six to the number of the six moveable heavens; for he who is inquiring of the frame of the world itself, must not derive reasons from these numbers, which have gained importance from things of later date.

"I sought again, in another way, whether the distance of every planet is not as the residuum of a sine; and its motion as the residuum of the sine of the complement in the same quadrant.



"Conceive the square A B to be constructed, whose side A C is equal to the semidiameter of the universe. From the angle B opposite to A the place of the sun, or centre of the world, describe the quadrant D C with the radius B C. Then in A C, the true radius of the world, let the sun, fixed stars, and planets be marked at their respective distances, and from these points draw lines parallel to B C, meeting the quadrant. I imagined the moving force acting on each of the planets to be in the proportion of these parallels. In the line of the sun is infinity, because A D is touched, and not cut, by the quadrant: therefore the moving force is infinite in the sun, as deriving no motion except from its own act. In Mercury the infinite line is cut off at K, and therefore at this point the motion is comparable with the others. In the fixed stars the line is altogether lost, and compressed into a mere point C; therefore at that point there is no moving force. This was the theorem, which was to be tried by calculation; but if any one will reflect that two things were wanting to me, first, that I did not know the size of the *Sinus Totus*, that is, the radius of the proposed quadrant; secondly, that the energies of the motions were not thus expressed otherwise than in relation one to another; whoever, I say, well considers this, will doubt, not without reason, as to the progress I was likely to make in this difficult course. And yet, with unremitting labour, and an infinite reciprocation of sines and arcs, I did get so far as to be convinced that this theory could not hold.

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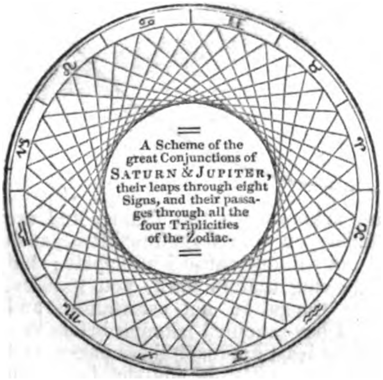
[*] The following scrupulous note added by Kepler in 1621 to a subsequent edition of this work, deserves to be quoted. It shows how entirely superior he was to the paltriness of attempting to appropriate the discoveries of others, of which many of his contemporaries had exhibited instances even on slighter pretences than this passage might have afforded him. The note is as follows: "Not circulating round Jupiter like the Medicæan stars. Be not deceived. I never had them in my thoughts, but, like the other primary planets, including the sun in the centre of the system within their orbits."

"Almost the whole summer was lost in these annoying labours; at last, by a trifling accident, I lighted more nearly on the truth. I looked on it as an interposition of Providence, that I should obtain by chance, what I had failed to discover with my utmost exertions; and I believed this the more, because I prayed constantly that I might succeed, if Copernicus had really spoken the truth. It happened on the 9th or 19th* day of July, in the year 1595, that, having occasion to show, in my lecture-room, the passages of the great conjunctions through eight signs, and how they pass gradually from one trine aspect to another, I inscribed in a circle a great number of triangles, or quasi-triangles, so that the end of one was made the beginning of another. In this manner a smaller circle was shadowed out by the points in which the lines crossed each other.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A Scheme of the great Conjunctions of SATURN & JUPITER, their leaps through eight Signs, and their passages through all the four Triplicities of the Zodiac.
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"The radius of a circle inscribed in a triangle is half the radius of that described about it; therefore the proportion between these two circles struck the eye as almost identical with that between Saturn and Jupiter, and the triangle is the first figure, just as Saturn and Jupiter are the first planets. On the spot I tried the second distance between Jupiter and Mars with a square, the third with a pentagon, the fourth with a hexagon. And as the eye again cried out against the second distance between Jupiter and Mars, I combined the square with a triangle and a pentagon. There would be no end of mentioning every trial. The failure of this fruitless attempt was the beginning of the last fortunate one; for I reflected, that in this way I should never reach the sun, if I wished to observe the same rule throughout; nor should I have any reason why there were six, rather than twenty or a hundred moveable orbits. And yet figures pleased me, as being quantities, and as having existed before the heavens; for quantity was created with matter, and the heavens afterwards. But if (this was the current of my thoughts), in relation to the quantity and proportion of the six orbits, as Copernicus has determined them among the infinite other figures, five only could be found having peculiar properties above the rest, my business would be done. And then again it struck me, what have plane figures to do among solid orbits? Solid bodies ought rather to be introduced. This, reader, is the invention and the whole substance of this little work; for if any one, though but moderately skilled in geometry, should hear these words hinted, the five regular solids will directly occur to him with the proportions of their circumscribed and inscribed spheres: he has immediately before his eyes that scholium of Euclid to the 18th proposition of his 13th Book, in which it is proved to be impossible that there should be, or be imagined, more than five regular bodies.

"What is worthy of admiration (since I had then no proof of any prerogatives of the bodies with regard to their order) is, that employing a conjecture which was far from being subtle, derived from the distances of the planets, I should at once attain my end so happily in arranging them, that I was not able to change anything afterwards with the utmost exercise of my reasoning powers. In memory of the event, I write down here for you the sentence, just as it fell from me, and in the words in which it was that moment conceived:—The Earth is the circle, the measurer of all; round it describe a dodecahedron, the circle including this will be Mars. Round Mars describe a tetrahedron, the circle including this will be Jupiter. Describe a cube round Jupiter, the circle including this will be Saturn. Now, inscribe in the Earth an icosaedron, the circle inscribed in it will be Venus. Inscribe an octaedron in Venus, the circle inscribed in it will be Mercury. This is the reason of the number of the planets.

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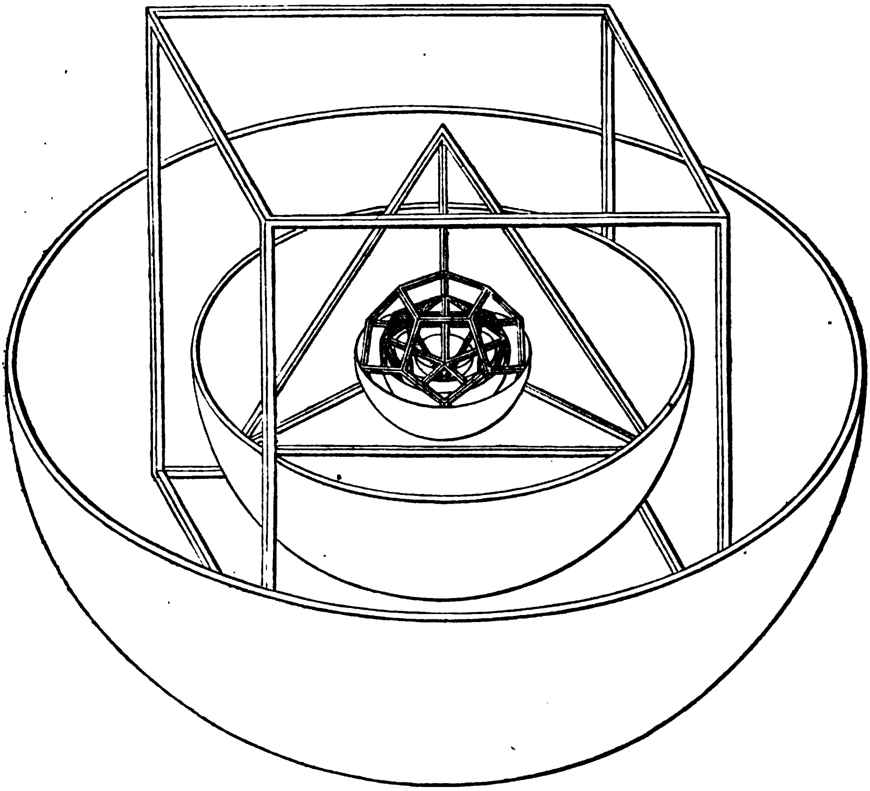
* This inconvenient mode of dating was necessary before the new or Gregorian style was universally adopted.



"This was the cause, and such the success, of my labour: now read my propositions in this book. The intense pleasure I have received from this discovery never can be told in words. I regretted no more the time wasted; I tired of no labour; I shunned no toil of reckoning; days and nights I spent in calculations, until I could see whether this opinion would agree with the orbits of Copernicus, or whether my joy was to vanish into air. I willingly subjoin that sentiment of Archytas, as given by Cicero: 'If I could mount up into heaven, and thoroughly perceive the nature of the world, and beauty of the stars, that admiration would be without a charm for me, unless I had some one like you, reader, candid, attentive, and eager for knowledge, to whom to describe it.' If you acknowledge this feeling, and are candid, you will refrain from blame, such as not without cause I anticipate; but if, leaving that to itself, you fear lest these things be not ascertained, and that I have shouted triumph before victory, at least approach these pages, and learn the matter in consideration: you will not find, as just now, new and unknown planets interposed; that boldness of mine is not approved, but those old ones very little loosened, and so furnished by the interposition (however absurd you may think it) of rectilinear figures, that in future you may give a reason to the rustics when they ask for the hooks which keep the skies from falling.—Farewell."

In the third chapter Kepler mentions, that a thickness must be allowed to each orb sufficient to include the greatest and least distance of the planet from the sun. The form and result of his comparison with the real distances are as follows:—

					Book V.
If the inner surface of the orbit of	Saturn	be taken at 1000, then the outer one of	Jupiter = 577	According to Copernicus they are	635 Ch. 9
	Jupiter		Mars = 333		333 — 14
	Mars		Earth = 795		757 — 19
	Earth		Venus = 795		794 — 21, 22
	Venus		Mercury = 577		723 — 27

It will be observed, that Kepler's results were far from being entirely satisfactory; but he seems to have flattered himself, that the differences might be attributed to erroneous measurements. Indeed, the science of observation was then so much in its infancy, that such an assertion might be made without incurring much risk of decisive refutation.

Kepler next endeavoured to determine why the regular solids followed in this rather than any other order; and his imagination soon created a variety of essential distinctions between the cube, pyramid, and dodecahedron, belonging to the superior planets, and the other two.

The next question examined in the book, is the reason why the zodiac is divided into 360 degrees; and on this subject, he soon becomes enveloped in a variety of subtle considerations, (not very intelligible in the original, and still more difficult to explain shortly to others unacquainted with it,) in relation to the divisions of the musical scale; the origin of which he identifies with his five favourite solids. The twentieth chapter is appropriated to a more interesting inquiry, containing the first traces of his finally successful researches into the proportion between the distances of the planets, and the times of their motions round the sun. He begins with the generally admitted fact, that the more distant planets move more slowly; but in order to show that the proportion, whatever it may be, is not the simple one of the distances, he exhibits the following little Table:—

	♄					
	D. Scr.	♃				
♄	10759.12	D. Scr.	♂			
♃	6159	4332.37	D.Scr.	⊕		
♂	1785	1282	686.59	D.Scr.	♀	
⊕	1174	843	452	365.15	D.Scr.	☿
♀	844	606	325	262.30	224.42	D.Scr.
☿	434	312	167	135	115	87.58

At the head of each vertical column is placed the real time (in days and sexagesimal parts) of the revolution of the planet placed above it, and underneath the days due to the other inferior planets, if they observed the proportion of distance. Hence it appears that this proportion in every case gives a time greater than the truth; as for instance, if the earth's rate of revolution were to Jupiter's in the proportion of their distances, the second column shows that the time of her period would be 843 instead of 365¼ days; so of the rest. His next attempt was to compare them by two by two, in which he found that he arrived at a proportion something like the proportion of the distances, although as yet far from obtaining it exactly. This process amounts to taking the quotients obtained by dividing the period of each planet by the period of the one next beyond.

For if each of the Periods of	♄ 10759.27	be successively taken to consist of 1000 equal parts, the periods of the planet next below will contain of those parts in	♃ 403
	♃ 4332.37		♂ 159
	♂ 686.59		⊕ 532
	⊕ 365.15		♀ 615
	♀ 244.42		☿ 392

But if the distance of each planet in succession be taken to consist of 1000 equal parts, the distance of the next below will contain, according to Copernicus, in	♃ 572
	♂ 290
	⊕ 658
	♀ 719
	☿ 500

From this table he argued that to make the proportions agree, we must assume one of two things, "either that the moving intelligences of the planets are weakest in those which are farthest from the Sun, or that there is one moving intelligence in the Sun, the common centre forcing them all round, but those most violently which are nearest, and that it languishes in some sort, and grows weaker at the most distant, because of the remoteness and the attenuation of the virtue."

We stop here to insert a note added by Kepler to the later editions, and shall take advantage of the same interruption to warn the reader not to confound this notion of Kepler with the theory of a gravitating force towards the Sun, in the sense in which we now use those words. According to our theory, the effect of the presence of the Sun upon the planet is to pull it towards the centre in a straight line, and the effect of the motion thus produced combined with the motion of the planet, which if undisturbed would be in a straight line inclined to the direction of the radius, is, that it describes a curve round the Sun. Kepler considered his planets as perfectly quiet and unwilling to move when left alone; and that this virtue supposed by him to proceed in every direction out of the Sun, swept them round, just as the sails of a windmill would carry round anything which became entangled in them. In other parts of his works Kepler mentions having speculated on a real attractive force in the centre; but as he knew that the planets are not always at the same distance from the Sun, and conceived erroneously, that to remove them from their least to their greatest distance a repulsive force must be supposed alternating with an attractive one, he laid aside this notion as improbable. In a note he acknowledges that when he wrote the passage just quoted, imbued as he then was with Scaliger's notions on moving intelligences, he literally believed, "that each planet was moved by a living spirit, but afterwards came to look on the moving cause as a corporeal though immaterial substance, something in the nature of light which is observed to diminish similarly at increased distances." He then proceeds as follows in the original text.

"Let us then assume, as is very probable, that motion is dispensed by the sun in the same manner as light. The proportion in which light emanating from a centre is diminished, is taught by optical writers: for there is the same quantity of light, or of the solar rays, in the small circles as in the large; and therefore, as it is more condensed in the former, more attenuated in the latter, a measure of the attenuation may be derived from the proportion of the circles themselves, both in the case of light and of the moving virtue. Therefore, by how much the orbit of Venus is greater than that of Mercury, in the same proportion will the motion of the latter be stronger, or more hurried, or more swift, or more powerful, or by whatever other word you like to express the fact, than that of the former. But a larger orbit would require a proportionably longer time of revolution, even though the moving force were the same. Hence it follows that the one cause of a greater distance of the planet from the Sun, produces a double effect in increasing the period; and conversely the increase of the periods will be double the difference of the distances. Therefore, half the increment added to the shorter period ought to give the true proportion of the distances, so that the sum should represent the distance of the superior planet, on the same scale on which the shorter period represents the distance of the inferior one. For instance, the period of Mercury is nearly 88 days; that of Venus is $224\frac{2}{3}$, the difference is $136\frac{2}{3}$: half of this is $68\frac{1}{3}$, which, added to 88, gives $156\frac{1}{3}$. The mean distance of Venus ought, therefore, to be, in proportion to that of Mercury, as $156\frac{1}{3}$ to 88. If this be done with all the planets, we get the following results, taking successively, as before, the distance of each planet at 1000.

The distance in parts of which the distance of the next superior planet contains 1000, is at	♃	574	But according to Copernicus they are respectively	572
	♂	274		290
	⊕	694		658
	♀	762		719
	☿	563		500

As you see, we have now got nearer the truth."

Finding that this theory of the rate of diminution would not bring him quite close to the result he desired to find, Kepler immediately imagined another. This latter occasioned him a great deal of perplexity, and affords another of the frequently recurring instances of the waste of time and ingenuity occasioned by his impetuous and precipitate temperament. Assuming the distance of any planet, as for instance of Mars, to be the unit of space, and the virtue at that distance to be the unit of force, he supposed that as many particles as the virtue at the Earth gained upon that of Mars, so many particles of distance did the Earth lose. He endeavoured to determine the respective positions of the planets upon this theory, by the rules of false position, but was much astonished at finding the same exactly as on his former hypothesis. The fact was, as he himself discovered, although not until after several years, that he had become confused in his calculation; and when half through the process, had retraced his steps so as of course to arrive again at the numbers from which he started, and which he had taken from his former results. This was the real secret of the identity of the two methods; and if, when he had taken the distance of Mars at 1000, instead of assuming the distance of the earth at 694, as he did, he had taken any other number, and operated upon it in the same manner, he would have had the same reason for relying on the accuracy of his supposition. As it was, the result utterly confounded him; and he was obliged to leave it with the remark, that "the two theories are thus proved to be the same in fact, and only different in form; although how that can possibly be, I have never to this day been able to understand."—His perplexity was very reasonable; they are by no means the same; it was only his method of juggling with the figures which seemed to connect them.

Notwithstanding all its faults, the genius and unwearied perseverance displayed by Kepler in this book, immediately ranked him among astronomers of the first class; and he received the most flattering encomiums from many of the most celebrated; among others, from Galileo and Tycho Brahe, whose opinion he invited upon his performance. Galileo contented himself with praising in general terms the ingenuity and good faith which appeared so conspicuously in it. Tycho Brahe entered into a more detailed criticism of the work, and, as Kepler shrewdly remarked, showed how highly he thought of it by advising him to try to adapt something of the same kind to the Tychonic system. Kepler also sent a copy of his book to the imperial astronomer, Raimar, with a complimentary letter, in which he exalted him above all other astronomers of the age. Raimar had surreptitiously acquired a notion of Tycho Brahe's theory, and published it as his own; and Tycho, in his letter, complained of Kepler's extravagant flattery. This drew a long apologetical reply from Kepler, in which he attributed the admiration he had expressed of Raimar to his own want of information at that time, having since met with many things in Euclid and Regiomontanus, which he then believed original in Raimar. With this explanation, Tycho professed himself perfectly satisfied.

Chapter II.

Kepler's Marriage—He joins Tycho Brahe at Prague—Is appointed Imperial Mathematician—Treatise on the New Star.

The publication of this extraordinary book, early as it occurs in the history of Kepler's life, was yet preceded by his marriage. He had contemplated this step so early as 1592; but that suit having been broken off, he paid his addresses, in 1596, to Barbara Muller von Muhleckh. This lady was already a widow for the second time, although two years younger than Kepler himself. On occasion of this alliance he was required to prove the nobility of his family, and the delay consequent upon the inquiry postponed the marriage till the following year. He soon became involved in difficulties in consequence of this inconsiderate engagement: his wife's fortune was less than he had been led to expect, and he became embroiled on that account with her relations. Still more serious inconvenience resulted to him from the troubled state in which the province of Styria was at that time, arising out of the disputes in Bohemia and the two great religious parties into which the empire was now divided, the one headed by Rodolph, the feeble minded emperor,—the other by Matthias, his ambitious and enterprising brother.

In the year following his marriage, he thought it prudent, on account of some opinions he had unadvisedly promulgated, (of what nature does not very distinctly appear,) to withdraw himself from Gratz into Hungary. Thence he transmitted several short treatises to his friend Zehentmaier, at Tubingen—"On the Magnet," "On the Cause of the Obliquity of the Ecliptic," and "On the Divine Wisdom, as shown in the Creation." Little is known of these works beyond the notice taken of them in Zehentmaier's answers. Kepler has himself told us, that his magnetic philosophy was built upon the investigations of Gilbert, of whom he always justly spoke with the greatest respect.

About the same time a more violent persecution had driven Tycho Brahe from his observatory of Uraniburg, in the little island of Hueen, at the entrance of the Baltic. This had been bestowed on him by the munificence of Frederick I. of Denmark, who liberally furnished him with every means of prosecuting his astronomical observations. After Frederick's death, Tycho found himself unable to withstand the party which had constantly opposed him, and was forced, at a great loss and much inconvenience, to quit his favourite island. On the invitation of the emperor, Rudolph II., he then betook himself, after a short stay at Hamburg, to the castle of Benach, near Prague, which was assigned to him with an annual pension of three thousand florins, a truly munificent provision in those times and that country.

Kepler had been eager to see Tycho Brahe since the latter had intimated that his observations had led him to a more accurate determination of the excentricities of the orbits of the planets. By help of this, Kepler hoped that his theory might be made to accord more nearly with the truth; and on learning that Tycho was in Bohemia, he immediately set out to visit him, and arrived at Prague in January, 1600. From thence he wrote a second letter to Tycho, not having received the answer to his former apology, again excusing himself for the part he had appeared to take with Raimar against him. Tycho replied immediately in the kindest manner, and begged he would repair to him directly:—"Come not as a stranger, but as a very welcome friend; come and share in my observations with such instruments as I have with me, and as a dearly beloved associate." During his stay of three or four months at Benach, it was settled that Tycho should apply to the emperor, to procure him the situation of assistant in the observatory. Kepler then returned to Gratz, having previously received an intimation, that he might do so in safety. The plan, as it had been arranged between them was, that a letter should be procured from the emperor to the states of Styria, requesting that Kepler might join Tycho Brahe for two years, and retain his salary during that time: a hundred florins were to be added annually by the emperor, on account of the greater dearness of living at Prague. But before everything was concluded, Kepler finally threw up his situation at Gratz, in consequence of new dissensions. Fearing that this would utterly put an end to his hopes of connecting himself with Tycho, he determined to revive his claims on the patronage of the Duke of Wirtemberg. With this view he entered into correspondence with Mästlin and some of his other friends at Tubingen, intending to prosecute his medical studies, and offer himself for the professorship of medicine in that university. He was dissuaded from this scheme by the pressing instances of Tycho, who undertook to exert himself in procuring a permanent settlement for him from the emperor, and assured him, even if that attempt should fail, that the language he had used when formerly inviting him to visit him at Hamburg, should not be forgotten. In consequence of this encouragement," Kepler abandoned his former scheme, and travelled again with his wife to Prague. He was detained a long time on the road by violent illness, and his money became entirely exhausted. On this he wrote complainingly to Tycho, that he was unable without assistance to travel even the short distance which still separated them, far less to await much longer the fulfilment of the promises held out to him.

By his subsequent admissions, it appears that for a considerable time he lived entirely on Tycho's bounty, and by way of return, he wrote an essay against Raimar, and against a Scotchman named Liddell, professor at Rostoch and Helmstadt, who, like Raimar, had appropriated to himself the credit of the Tychonic system. Kepler never adopted this theory, and indeed, as the question merely regarded priority of invention, there could be no occasion, in the discussion, for an examination of its principles.

This was followed by a transaction, not much to Kepler's credit, who in the course of the following year, and during a second absence from Prague, fancied that he had some reason to complain of Tycho's behaviour, and wrote him a violent letter, filled with reproaches and insults. Tycho appears to have behaved in this affair with great moderation: professing to be himself occupied with the marriage of his daughter, he gave the care of replying to Kepler's charges, to Ericksen, one of his assistants, who, in a very kind and temperate letter, pointed out to him the ingratitude of his behaviour, and the groundlessness of his dissatisfaction. His principal complaint seems to have been, that Tycho had not sufficiently supplied his wife with money during his absence. Ericksen's letter produced an immediate and entire change in Kepler's temper, and it is only from the humble recantation which he instantaneously offered that we learn the extent of his previous violence. "Most noble Tycho," these are the words of his letter, "how shall I enumerate or rightly estimate your benefits conferred on me! For two months you have liberally and gratuitously maintained me, and my whole family; you have provided for all my wishes; you have done me every possible kindness; you have communicated to me everything you hold most dear; no one, by word or deed, has intentionally injured me in anything: in short, not to your children, your wife, or yourself have you shown more indulgence than to me. This being so, as I am anxious to put upon record, I cannot reflect without consternation that I should have been so given up by God to my own intemperance, as to shut my eyes on all these benefits; that, instead of modest and respectful gratitude, I should indulge for three weeks in continual moroseness towards all your family, in headlong passion, and the utmost insolence towards yourself, who possess so many claims on my veneration from your noble family, your extraordinary learning, and distinguished reputation. Whatever I have said or written against the person, the fame, the honour, and the learning of your excellency; or whatever, in any other way, I have injuriously spoken or written, (if they admit no other more favourable interpretation,) as to my grief I have spoken and written many things, and more than I can remember; all and everything I recant, and freely and honestly declare and profess to be groundless, false, and incapable of proof." Hoffmann, the president of the states of Styria, who had taken Kepler to Prague on his first visit, exerted himself to perfect the reconciliation, and this hasty quarrel was entirely passed over.

On Kepler's return to Prague, in September, 1601, he was presented to the Emperor by Tycho, and honoured with the title of Imperial Mathematician, on condition of assisting Tycho in his calculations. Kepler desired nothing more than this condition, since Tycho was at that time probably the only person in the world who possessed observations sufficient for the reform which he now began to meditate in the theory of astronomy. Rudolph appears to have valued both Tycho Brahe and Kepler as astrologers rather than astronomers; but although unable to appreciate rightly the importance of the task they undertook, of compiling a new set of astronomical tables founded upon Tycho's observations, yet his vanity was flattered with the prospect of his name being connected with such a work, and he made liberal promises to defray the expense of the new Rudolphine Tables. Tycho's principal assistant at this time was Longomontanus, who altered his name to this form, according to the prevalent fashion of giving to every name a Latin termination. Lomborg or Longbierg was the name, not of his family, but of the village in Denmark, where he was born, just as Müller was seldom called by any other name than Regiomontanus, from his native town Königsberg, as George Joachim Rheticus was so surnamed from Rhetia, the country of the Grisons, and as Kepler himself was sometimes called Leonmontanus, from Leonberg, where he passed his infancy. It was agreed between Longomontanus and Kepler, that in discussing Tycho's observations, the former should apply himself especially to the Moon, and the latter to Mars, on which planet, owing to its favourable position, Tycho was then particularly engaged. The nature of these labours will be explained when we come to speak of the celebrated book "On the Motions of Mars."

This arrangement was disturbed by the return of Longomontanus into Denmark, where he had been offered an astronomical professorship, and still more by the sudden death of Tycho Brahe himself in the following October. Kepler attended him during his illness, and after his death undertook to arrange some of his writings. But, in consequence of a misunderstanding between him and Tycho's family, the manuscripts were taken out of his hands; and when, soon afterwards, the book appeared, Kepler complained heavily that they had published, without his consent or knowledge, the notes and interlineations added by him for his own private guidance whilst preparing it for publication.

On Tycho's death, Kepler succeeded him as principal mathematician to the emperor; but although he was thus nominally provided with a liberal salary, it was almost always in arrear. The pecuniary embarrassments in which he constantly found himself involved, drove him to the resource of gaining a livelihood by casting nativities. His peculiar temperament rendered him not averse from such speculations, and he enjoyed considerable reputation in this line, and received ample remuneration for his predictions. But although he did not scruple, when consulted, to avail himself in this manner of the credulity of his contemporaries, he passed over few occasions in his works of protesting against the futility of this particular genethliac astrology. His own astrological creed was in a different strain, more singular, but not less extravagant. We shall defer entering into any details concerning it, till we come to treat of his book on Harmonics, in which he has collected and recapitulated the substance of his scattered opinions on this strange subject.

His next works deserving notice are those published on occasion of the new star which shone out with great splendour in 1604, in the constellation Cassiopeia [*]. Immediately on its appearance, Kepler wrote a short account of it in German, marked with all the oddity which characterises most of his productions. We shall see enough of his astronomical calculations when we come to his book on Mars; the following passage will probably be found more amusing.

After comparing this star with that of 1572, and mentioning that many persons who had seen it maintained this to be the brighter of the two, since it was nearly twice the size of its nearest neighbour, Jupiter, he proceeds as follows:—"Yonder one chose for its appearance a time no way remarkable, and came into the world quite unexpectedly, like an enemy storming a town, and breaking into the market-place before the citizens are aware of his approach; but ours has come exactly in the year of which astrologers have written so much about the fiery trigon that happens in it [†]; just in the month in which (according to Cyprian) Mars comes up to a very perfect conjunction with the other two superior planets; just in the day when Mars has joined Jupiter, and just in the place where this conjunction has taken place. Therefore the apparition of this star is not like a secret hostile irruption, as was that one of 1572, but the spectacle of a public triumph, or the entry of a mighty potentate; when the couriers ride in some time before, to prepare his lodgings, and the crowd of young urchins begin to think the time over-long to wait: then roll in, one after another, the ammunition, and money, and baggage waggons, and presently the trampling of horse, and the rush of people from every side to the streets and windows; and when the crowd have gazed with their jaws all agape at the troops of knights; then at last, the trumpeters, and archers, and lackeys, so distinguish the person of the monarch, that there is no occasion to point him out, but every one cries out of his own accord—'Here we have him!'—What it may portend is hard to determine, and thus much only is certain, that it comes to tell mankind either nothing at all, or high and weighty news, quite beyond human sense and understanding. It will have an important influence on political and social relations; not indeed by its own nature, but, as it were, accidentally through the disposition of mankind. First, it portends to the booksellers great disturbances, and tolerable gains; for almost every *Theologus*, *Philosophicus*, *Medicus*, and *Mathematicus*, or whoever else, having no laborious occupation intrusted to him, seeks his pleasure *in studiis*, will make particular remarks upon it, and will wish to bring these remarks to the light. Just so will others, learned and unlearned, wish to know its meaning, and they will buy the authors who profess to tell them. I mention these things merely by way of example, because, although thus much can be easily predicted without great skill, yet may it happen just as easily, and in the same manner, that the vulgar, or whoever else is of easy faith, or it may be, crazy, may wish to exalt himself into a great prophet; or it may even happen that some powerful lord, who has good foundation and beginning of great dignities, will be cheered on by this phenomenon to venture on some new scheme, just as if God had set up this star in the darkness merely to enlighten them."

It would hardly be supposed, from the tenor of this last passage, that the writer of it was not a determined enemy to astrological predictions of every description. In 1602 he had published a disputation, not now easily met with, "On the Principles of Astrology," in which it seems that he treated the professed astrologers with great severity. The essence of this book is probably contained in the second treatise on the new star, which he published in 1606 [*]. In this volume he inveighs repeatedly against the vanity and worthlessness of ordinary astrology, declaring at the same time, that the professors of that art know that this judgment is pronounced by one well acquainted with its principles. "For if the vulgar are to pronounce who is the best astrologer, my reputation is known to be of the highest order; if they prefer the judgment of the learned, they are already condemned. Whether they stand with me in the eyes of the populace, or I fall with them before the learned, in both cases I am in their ranks; I am on a level with them; I cannot be renounced."

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[*] See Life of Galileo, p. 16.

[†] The fiery trigon occurs about once in every 800 years, when Saturn, Jupiter, and Mars are in the three fiery signs, Aries, Leo, and Sagittarius.

[*] The copy of this work in the British Museum is Kepler's presentation copy to our James I. On the blank leaf, opposite the title-page, is the following inscription, apparently in the author's handwriting:—"Regi philosophanti, philosophus serviens, Platoni Diogenes, Britannias tenenti, Pragæ stipem mendicans ab Alexandro, e dolio conductitio, hoc suum philosophema misit et commendavit."

The theory which Kepler proposed to substitute is intimated shortly in the following passage: "I maintain that the colours and aspects, and conjunctions of the planets, are impressed on the natures or faculties of sublunary things, and when they occur, that these are excited as well in forming as in moving the body over whose motion they preside. Now let no one conceive a prejudice that I am anxiously seeking to mend the deplorable and hopeless cause of astrology by far-fetched subtilties and miserable quibbling. I do not value it sufficiently, nor have I ever shunned having astrologers for my enemies. But a most unfailing experience (as far as can be hoped in natural phenomena) of the excitement of sublunary natures by the conjunctions and aspects of the planets, has instructed and compelled my unwilling belief."

After exhausting other topics suggested by this new star, he examines the different opinions on the cause of its appearance. Among others he mentions the Epicurean notion, that it was a fortuitous concourse of atoms, whose appearance in this form was merely one of the infinite number of ways in which, since the beginning of time, they have been combined. Having descanted for some time on this opinion, and declared himself altogether hostile to it, Kepler proceeds as follows:—"When I was a youth, with plenty of idle time on my hands, I was much taken with the vanity, of which some grown men are not ashamed, of making anagrams, by transposing the letters of my name, written in Greek, so as to make another sentence: out of Ιωάννης Κεπλῆρος I made Σειρήνων κάπηλος[*]; in Latin, out of *Joannes Keplerus* came *Serpens in akuleo*[†]. But not being satisfied with the meaning of these words, and being unable to make another, I trusted the thing to chance, and taking out of a pack of playing cards as many as there were letters in the name, I wrote one upon each, and then began to shuffle them, and at each shuffle to read them in the order they came, to see if any meaning came of it. Now, may all the Epicurean gods and goddesses confound this same chance, which, although I spent a good deal of time over it, never showed me anything like sense even from a distance[*]. So I gave up my cards to the Epicurean eternity, to be carried away into infinity, and, it is said, they are still flying about there, in the utmost confusion among the atoms, and have never yet come to any meaning. I will tell these disputants, my opponents, not my own opinion, but my wife's. Yesterday, when weary with writing, and my mind quite dusty with considering these atoms, I was called to supper, and a salad I had asked for was set before me. It seems then, said I aloud, that if pewter dishes, leaves of lettuce, grains of salt, drops of water, vinegar, and oil, and slices of egg, had been flying about in the air from all eternity, it might at last happen by chance that there would come a salad. Yes, says my wife, but not so nice and well dressed as this of mine is."

CHAPTER III.

Kepler publishes his Supplement to Vitellion—Theory of Refraction.

DURING several years Kepler remained, as he himself forcibly expressed it, begging his bread from the emperor at Prague, and the splendour of his nominal income served only to increase his irritation, at the real neglect under which he nevertheless persevered in his labours. His family was increasing, and he had little wherewith to support them beyond the uncertain proceeds of his writings and nativities. His salary was charged partly on the states of Silesia, partly on the imperial treasury; but it was in vain that repeated orders were procured for the payment of the arrears due to him. The resources of the empire were drained by the constant demands of an engrossing war, and Kepler had not sufficient influence to enforce his claims against those who thought even the smallest sum bestowed upon him ill spent, in fostering profitless speculations. In consequence of this niggardliness, Kepler was forced to postpone the publication of the Rudolphine Tables, which he was engaged in constructing from his own and Tycho Brahe's observations, and applied himself to other works of a less costly description. Among these may be mentioned a "Treatise on Comets," written on occasion of one which appeared in 1607: in this he suggests that they are planets moving in straight lines. The book published in 1604, which he entitles "A Supplement to Vitellion," may be considered as containing the first reasonable and consistent theory of optics, especially in that branch of it usually termed dioptrics, which relates to the theory of vision through transparent substances. In it was first explained the true use of the different parts of the eye, to the knowledge of which Baptista Porta had already approached very nearly, though he stopped short of the accurate truth. Kepler remarked the identity of the mechanism in the eye with that beautiful invention of Porta's, the camera obscura; showing, that the light which falls from external objects on the eye is refracted through a transparent substance, called, from its form and composition, the crystalline lens, and makes a picture on the fine net-work of nerves, called the retina, which lies at the back of the eye. The manner in which the existence of this coloured picture on the retina causes to the individual the sensation of sight, belongs to a theory not purely physical; and beyond this point Kepler did not attempt to go.

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[*] The tapster of the Sirens.

[†] A serpent in his sting.

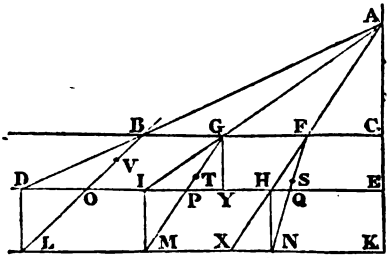
[*] In one of his anonymous writings Kepler has anagrammatized his name, *Joannes Keplerus*, in a variety of other forms, probably selected from the luckiest of his shuffles:—"*Kleopas Herennius, Helenor Kapuensis, Raspinus Enkeleo, Kenneus Puerilis.*"

The direction into which rays of light (as they are usually called) are bent or refracted in passing through the air and other transparent substances or mediums, is discussed in this treatise at great length. Tycho Brahe had been the first astronomer who recognized the necessity of making some allowance on this account in the observed heights of the stars. A long controversy arose on this subject between Tycho Brahe and Rothman, the astronomer at Hesse Cassel, a man of unquestionable talent, but of odd and eccentric habits. Neither was altogether in the right, although Tycho had the advantage in the argument. He failed however to establish the true law of refraction, and Kepler has devoted a chapter to an examination of the same question. It is marked by precisely the same qualities as those appearing so conspicuously in his astronomical writings:—great ingenuity; wonderful perseverance; bad philosophy. That this may not be taken solely upon assertion, some samples of it are subjoined. The writings of the authors of this period are little read or known at the present day; and it is only by copious extracts that any accurate notion can be formed of the nature and value of their labours. The following tedious specimen of Kepler's mode of examining physical phenomena is advisedly selected to contrast with his astronomical researches: though the luck and consequently the fame that attended his divination were widely different on the two occasions, the method pursued was the same. After commenting on the points of difference between Rothman and Tycho Brahe, Kepler proceeds to enumerate his own endeavours to discover the law of refraction.

"I did not leave untried whether, by assuming a horizontal refraction according to the density of the medium, the rest would correspond with the sines of the distances from the vertical direction, but calculation proved that it was not so: and indeed there was no occasion to have tried it, for thus the refractions would increase according to the same law in all mediums, which is contradicted by experiment.

"The same kind of objection may be brought against the cause of refraction alleged by Alhazen and Vitellion. They say that the light seeks to be compensated for the loss sustained at the oblique impact; so that in proportion as it is enfeebled by striking against the denser medium, in the same degree does it restore its energy by approaching the perpendicular, that it may strike the bottom of the denser medium with greater force; for those impacts are most forcible which are direct. And they add some subtle notions, I know not what, how the motion of obliquely incident light is compounded of a motion perpendicular and a motion parallel to the dense surface, and that this compound motion is not destroyed, but only retarded by meeting the denser medium.

"I tried another way of measuring the refraction, which should include the density of the medium and the incidence: for, since a denser medium is the cause of refraction, it seems to be the same thing as if we were to prolong the depth of the medium in which the rays are re-



fracted into as much space as would be filled by the denser medium under the force of the rarer one.

"Let A be the place of the light, B C the surface of the denser medium, D E its bottom. Let A B, A G, A F be rays falling obliquely, which would arrive at D, I, H, if the medium were uniform. But because it is denser, suppose the bottom to be depressed to K L, determined by this that there is as much of the denser matter contained in the space DC as of the rarer in LC: and thus, on the sinking of the whole bottom DE, the points D, I, H, E will descend vertically to L, M, N, K. Join the points B L, G M, F N, cutting D E in O, P, Q; the refracted rays will be A B O, A G P, A F Q."—"This method is refuted by experiment; it gives the refractions near the perpendicular A C too great in respect of those near the horizon. Whoever has leisure may verify this, either by calculation or compasses. It may be added that the reasoning itself is not very sure-footed, and, whilst seeking to measure other things, scarcely takes in and comprehends itself." This reflection must not be mistaken for the dawn of suspicion that his examination of philosophical questions began not altogether at the right end: it is merely an acknowledgment that he had not yet contrived a theory with which he was quite satisfied before it was disproved by experiment.

After some experience of Kepler's miraculous good fortune in seizing truths across the wildest and most absurd theories, it is not easy to keep clear of the opposite feeling of surprise whenever any of his extravagancies fail to discover to him some beautiful law of nature. But we must follow him as he plunges deeper in this unsuccessful inquiry; and the reader must remember, in order fully to appreciate this method of philosophizing, that it is almost certain that Kepler laboured upon every one of the gratuitous suppositions that he makes, until positive experiment satisfied him of their incorrectness.

"I go on to other methods. Since density is clearly connected with the cause of the refractions, and refraction itself seems a kind of compression of light, as it were, towards the perpendicular, it occurred to me to examine whether there was the same proportion between the mediums in respect of density and the parts of the bottom illuminated by the light, when let into a vessel, first empty, and afterwards filled with water. This mode branches out into many: for the proportion may be imagined, either in the straight lines, as if one should say that the line E Q, illuminated by refraction, is to EH illuminated directly, as the density of the one medium is to that of the other—Or another may suppose the proportion to be between F C and F H—Or it may be conceived to exist among surfaces, or so that some power of E Q should be to some power of E H in this proportion, or the circles or similar figures described on them. In this manner the proportion of E Q to E P would be double that of E H to EI—Or the proportion may be conceived existing among the solidities of the pyramidal frustums F H E C, F Q E C—Or, since the proportion of the mediums involves a threefold consideration, since they have density in length, breadth, and thickness, I proceeded also to examine the cubic proportions among the lines E Q, E H.

"I also considered other lines. From any of the points of refraction as G, let a perpendicular GY be dropped upon the bottom. It may become a question whether possibly the triangle I G Y, that is, the base I Y, is divided by the refracted ray G P, in the proportion of the densities of the mediums.

"I have put all these methods here together, because the same remark disproves them all. For, in whatever manner, whether as line, plane, or pyramid, E I observes a given proportion to E P, or the abbreviated line Y I to Y P, namely, the proportion of the mediums, it is sure that E I, the tangent of the distance of the point A from the vertex, will become infinite, and will, therefore make E P or Y P, also infinite. Therefore, I G P, the angle of refraction, will be entirely lost; and, as it approaches the horizon, will gradually become less and less, which is contrary to experiment.

"I tried again whether the images are equally removed from their points of refraction, and whether the ratio of the densities measures the least distance. For instance, supposing E to be the image, C the surface of the water, K the bottom, and C E to C K in the proportion of the densities of the mediums. Now, let F, G, B, be three other points of refraction and images at S, T, V, and let C E be equal to F S, G T, and B V. But according to this rule an image E would still be somewhat raised in the perpendicular A K, which is contrary to experiment, not to mention other contradictions. Thirdly, whether the proportion of the mediums holds between F H and F X, supposing H to be the place of the image? Not at all. For so, C E would be in the same proportion to C K, so that the height of the image would always be the same, which we have just refuted. Fourthly, whether the raising of the image at E is to the raising at H, as C E to F H? Not in the least; for so the images either would never begin to be raised, or, having once begun, would at last be infinitely raised, because F H at last becomes infinite. Fifthly, whether the images rise in proportion to the sines of the inclinations? Not at all; for so the proportion of ascent would be the same in all mediums. Sixthly, are then the images raised at first, and in perpendicular radiation, according to the proportion of the mediums, and do they subsequently rise more and more according to the sines of the inclinations? For so the proportion would be compound, and would become different in different mediums. There is nothing in it: for the calculation disagreed with experiment. And generally it is in vain to have regard to the image or the place of the image, for that very reason, that it is imaginary. For there is no connexion between the density of the medium or any real quality or refraction of the light, and an accident of vision, by an error of which the image happens.

"Up to this point, therefore, I had followed a nearly blind mode of inquiry, and had trusted to good fortune; but now I opened the other eye, and hit upon a sure method, for I pondered the fact, that the image of a thing seen under water approaches closely to the true ratio of the refraction, and almost measures it; that it is low if the thing is viewed directly from above; that by degrees it rises as the eye passes towards the horizon of the water. Yet, on the other hand, the reason alleged above, proves that the measure is not to be sought in the image, because the image is not a thing actually existing, but arises from a deception of vision which is purely accidental. By a comparison of these conflicting arguments, it occurred to me at length, to seek the causes themselves of the existence of the image under water, and in these causes the measure of the refractions. This opinion was strengthened in me by seeing that opticians had not rightly pointed out the cause of the image which appears both in mirrors and in water. And this was the origin of that labour which I undertook in the third chapter. Nor, indeed, was that labour trifling, whilst hunting down false opinions of all sorts among the principles, in a matter rendered so intricate by the false traditions of optical writers; whilst striking out half a dozen different paths, and beginning anew the whole business. How often did it happen that a rash confidence made me look upon that which I sought with such ardour, as at length discovered!

"At length I cut this worse than Gordian knot of catoptrics by analogy alone, by considering what happens in mirrors, and what must happen analogically in water. In mirrors, the image appears at a distance from the real place of the object, not being itself material, but produced solely by reflection at the polished surface. Whence it followed in water also, that the images rise and approach the surface, not according to the law of the greater or less density in the water, as the view is less or more oblique, but solely because of the refraction of the ray of light passing from the object to the eye. On which assumption, it is plain that every attempt I had hitherto made to measure refractions by the image, and its elevation, must fall to the ground. And this became more evident when I discovered the true reason why the image is in the same perpendicular line with the object both in mirrors and in dense mediums. When I had succeeded thus far by analogy in this most difficult investigation, as to the place of the image, I began to follow out the analogy further, led on by the strong desire of measuring refraction. For I wished to get hold of some measure of some sort, no matter how blindly, having no fear but that so soon as the measure should be accurately known, the cause would plainly appear. I went to work as follows. In convex mirrors the image is diminished, and just so in rarer mediums; in denser mediums it is magnified, as in concave mirrors. In convex mirrors the central parts of the image approach, and recede in concave farther than towards the circumference; the same thing happens in different mediums, so that in water the bottom appears depressed, and the surrounding parts elevated. Hence it appears that a denser medium corresponds with a concave reflecting surface, and a rarer one with a convex one: it was clear, at the same time, that the plane surface of the water affects a property of curvature. I was, therefore, to excogitate causes consistent with its having this effect of curvature, and to see if a reason could be given, why the parts of the water surrounding the incident perpendicular should represent a greater density than the parts just under the perpendicular. And so the thing came round again to my former attempts, which being refuted by reason and experiment, I was forced to abandon the search after a cause. I then proceeded to measurements."

Kepler then endeavoured to connect his measurements of different quantities of refraction with the cônic sections, and was tolerably well pleased with some of his results. They were however not entirely satisfactory, on which he breaks off with the following sentence: "Now, reader, you and I have been detained sufficiently long whilst I have been attempting to collect into one faggot the measure of different refractions: I acknowledge that the cause cannot be connected with this mode of measurement: for what is there in common between refractions made at the plane surfaces of transparent mediums, and mixtilinear conic sections? Wherefore, *quod Deus bene vortat*, we will now have had enough of the causes of this measure; and although, even now, we are perhaps erring something from the truth, yet it is better, by working on, to show our industry, than our laziness by neglect."

Notwithstanding the great length of this extract, we must add the concluding paragraph of the Chapter, directed, as we are told in the margin, against the "Tychonomasticks:"—

"I know how many blind men at this day dispute about colours, and how they long for some one to give some assistance by argument to their rash insults of Tycho, and attacks upon this whole matter of refractions; who, if they had kept to themselves their puerile errors and naked ignorance, might have escaped censure; for that may happen to many great men. But since they venture forth publicly, and with thick books and sounding titles, lay baits for the applause of the unwary, (for now-a-days there is more danger from the abundance of bad books, than heretofore from the lack of good ones,) therefore let them know that a time is set for them publicly to amend their own errors. If they longer delay doing this, it shall be open, either to me or any other, to do to these unhappy meddlers in geometry as they have taken upon themselves to do with respect to men of the highest reputation. And although this labour will be despicable, from the vile nature of the follies against which it will be directed, yet so much more necessary than that which they have undertaken against others, as he is a greater public nuisance, who endeavours to slander good and necessary inventions, than he who fancies he has found what is impossible to discover. Meanwhile, let them cease to plume themselves on the silence which is another word for their own obscurity."

Although Kepler failed, as we have seen, to detect the true law of refraction (which was discovered some years later by Willibrord Snell, a Flemish mathematician,) there are many things well deserving notice in his investigations. He remarked, that the quantity of refraction would alter, if the height of the atmosphere should vary; and also, that it would be different at different temperatures. Both these sources of variation are now constantly taken into account, the barometer and thermometer giving exact indications of these changes. There is also a very curious passage in one of his letters to Bregger, written in 1605, on the subject of the colours in the rainbow. It is in these words:—"Since every one sees a different rainbow, it is possible that some one may see a rainbow in the very place of my sight. In this case, the medium is coloured at the place of my vision, to which the solar ray comes to me through water, rain, or aqueous vapours. For the rainbow is seen when the sun is shining between rain, that is to say, when the sun also is visible. Why then do I not see the sun green, yellow, red, and blue, if vision takes place according to the mode of illumination? I will say something for you to attack or examine. The sun's rays are not coloured, except with a definite quantity of refraction. Whether you are in the optical chamber, or standing opposite glass globes, or walking in the morning dew, everywhere it is obvious that a certain and definite angle is observed, under which, when seen in dew, in glass, in water, the sun's splendour appears coloured, and under no other angle. There is no colouring by mere reflexion, without the refraction of a denser medium." How closely does Kepler appear, in this passage, to approach the discovery which forms not the least part of Newton's fame!

We also find in this work a defence of the opinion that the planets are luminous of themselves; on the ground that the inferior planets would, on the contrary supposition, display phases like those of the moon when passing between us and the sun. The use of the telescope was not then known; and, when some years later the form of the disk of the planets was more clearly defined with their assistance, Kepler had the satisfaction of finding his assertions verified by the discoveries of Galileo, that these changes do actually take place. In another of his speculations, connected with the same subject, he was less fortunate. In 1607 a black spot appeared on the face of sun, such as may almost always be seen with the assistance of the telescope, although they are seldom large enough to be visible to the unassisted eye. Kepler saw it for a short time, and mistook it for the planet Mercury, and with his usual precipitancy hastened to publish an account of his observation of this rare phenomenon. A few years later, Galileo discovered with his glasses, a great number of similar spots; and Kepler immediately retracted the opinion announced in his treatise, and acknowledged his belief that previous accounts of the same occurrence which he had seen in old authors, and which he had found great difficulty in reconciling with his more accurate knowledge of the motions of Mercury, were to be referred to a like mistake. On this occasion of the invention of the telescope, Kepler's candour and real love of truth appeared in a most favourable light. Disregarding entirely the disagreeable necessity, in consequence of the discoveries of this new instrument, of retracting several opinions which he had maintained with considerable warmth, he ranged himself at once on the side of Galileo, in opposition to the bitter and determined hostility evinced by most of those whose theories were endangered by the new views thus offered of the heavens. Kepler's quarrel with his pupil, Horky, on this account, has been mentioned in the "Life of Galileo;" and this is only a selected instance from the numerous occasions on which he espoused the same unpopular side of the argument. He published a dissertation to accompany Galileo's "Intelligencer of the Stars," in which he warmly expressed his admiration of that illustrious inquirer into nature. His conduct in this respect was the more remarkable, as some of his most intimate friends had taken a very opposite view of Galileo's merit, and seem to have laboured much to disturb their mutual regard; Mästlin especially, Kepler's early instructor, seldom mentioned to him the name of Galileo, without some contemptuous expression of dislike. These statements have rather disturbed the chronological order of the account of Kepler's works. We now return to the year 1609, in which he published his great and extraordinary book, "On the Motions of Mars;" a work which holds the intermediate place, and is in truth the connecting link, between the discoveries of Copernicus and Newton.

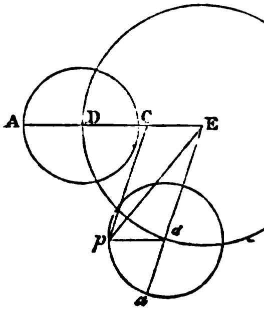
Chapter IV.

Sketch of the Astronomical Theories before Kepler.

Kepler had begun to labour upon these commentaries from the moment when he first made Tycho's acquaintance; and it is on this work that his reputation should be made mainly to rest. It is marked in many places with his characteristic precipitancy, and indeed one of the most important discoveries announced in it (famous among astronomers by the name of the Equable Description of Areas) was blundered upon by a lucky compensation of errors, of the nature of which Kepler remained ignorant to the very last. Yet there is more of the inductive method in this than in any of his other publications; and the unwearied perseverance with which he exhausted years in hunting down his often renewed theories, till at length he seemed to arrive at the true one, almost by having previously disproved every other, excites a feeling of astonishment nearly approaching to awe. It is wonderful how he contrived to retain his vivacity and creative fancy amongst the clouds of figures which he conjured up round him; for the slightest hint or shade of probability was sufficient to plunge him into the midst of the most laborious computations. He was by no means an accurate calculator, according to the following character which he has given of himself:—"Something of these delays must be attributed to my own temper, for *non omnia possumus omnes*, and I am totally unable to observe any order; what I do suddenly, I do confusedly, and if I produce any thing well arranged, it has been done ten times over. Sometimes an error of calculation committed by hurry, delays me a great length of time. I could indeed publish an infinity of things, for though my reading is confined, my imagination is abundant, but I grow dissatisfied with such confusion: I get disgusted and out of humour, and either throw them away, or put them aside to be looked at again; or, in other words, to be written again, for that is generally the end of it. I entreat you, my friends, not to condemn me for ever to grind in the mill of mathematical calculations: allow me some time for philosophical speculations, my only delight."

He was very seldom able to afford the expense of maintaining an assistant, and was forced to go through most of the drudgery of his calculations by himself; and the most confirmed and merest arithmetician could not have toiled more doggedly than Kepler did in the work of which we are about to speak.

In order that the language of his astronomy may be understood, it is necessary to mention briefly some of the older theories. When it had been discovered that the planets did not move regularly round the earth, which was supposed to be fixed in the centre of the world, a mechanism was contrived by which it was thought that the apparent irregularity could be represented, and yet the principle of uniform motion, which was adhered to with superstitious reverence, might be preserved. This, in its simplest form, consisted in supposing the planet to move uniformly in a small circle, called an *epicycle*, the centre of which moved with an equal angular motion in the opposite direction round the earth[*]. The circle Dd, described by D, the centre of the epicycle, was called the *deferent*. For instance, if the planet was supposed to be at A when the centre of the epicycle was at D, its position, when the centre of the epicycle had removed to d, would be at p, found by drawing dp parallel to DA. Thus, the angle adp, measuring the motion of the planet in its epicycle, would be equal to DEd, the angle described by the centre of the epicycle in the deferent. The angle pEd between Ep, the direction in which a planet so moving would be seen from the earth, supposed to be at E, and Ed the direction in which it would have been seen had it been moving in the centre of the deferent, was called the equation of the orbit, the word equation, in the language of astronomy, signifying what must be added or taken from an irregularly varying quantity to make it vary uniformly.



As the accuracy of observations increased, minor irregularities were discovered, which were attempted to be accounted for by making a second deferent of the epicycle, and making the centre of a second epicycle revolve in the circumference of the first, and so on, or else by supposing the revolution in the epicycle not to be completed in exactly the time in which its centre is carried round the deferent. Hipparchus was the first to make a remark by which the geometrical representation of these inequalities was considerably simplified. In fact, if EC be taken equal to pd, Cd will be a parallelogram, and consequently Cp equal to Ed, so that the machinery of the first deferent and epicycle amounts to supposing that the planet revolves uniformly in a circle round the point C, not coincident with the place of the earth. This was consequently called the excentric theory, in opposition to the former or concentric one, and was received as a great improvement. As the point d is not represented by this construction, the equation to the orbit was measured by the angle CpE, which is equal to pEd. It is not necessary to give any account of the manner in which the old astronomers determined the magnitudes and positions of these orbits, either in the concentric or excentric theory, the present object being little more than to explain the meaning of the terms it will be necessary to use in describing Kepler's investigations.

To explain the irregularities observed in the other planets, it became necessary to introduce another hypothesis, in adopting which the severity of the principle of uniform motion was somewhat relaxed. The machinery consisted partly of an excentric deferent round E, the earth, and on it an epicycle, in which the planet revolved uniformly; but the centre of the epicycle, instead of revolving uniformly round C, the centre of the deferent,

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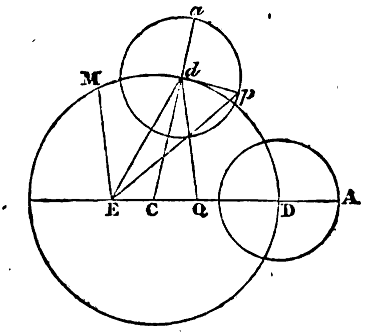
[*] By "the opposite direction" is meant, that while the motion in the circumference of one circle appeared, as viewed from its centre, to be from left to right, the other, viewed from its centre, appeared from right to left. This must be understood whenever these or similar expressions are repeated.



as it had hitherto been made to do, was supposed to move in its circumference with an uniform angular motion round a third point, Q; the necessary effect of which supposition was, that the linear motion of the centre of the epicycle ceased to be uniform. There were thus three points to be considered within the deferent; E, the place of the earth; C, the centre of the deferent, and sometimes called the centre of the orbit; and Q, called the centre of the equant, because, if any circle were described round Q, the planet would appear to a spectator at Q, to be moving equably in it. It was long uncertain what situation should be assigned to the centre of the equant, so as best to represent the irregularities to a spectator on the earth, until Ptolemy decided on placing it (in every case but that of Mercury, the observations on which were very doubtful) so that C, the centre of the orbit, lay just half way in the straight line, joining Q, the centre of equable motion, and E, the place of the earth. This is the famous principle, known by the name of the bisection of the excentricity.

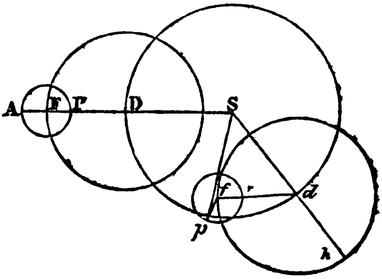
The first equation required for the planet's motion was thus supposed to be due to the displacement of E, the earth, from Q, the centre of uniform motion, which was called the excentricity of the equant: it might be represented by the angle *d* E M, drawing E M parallel to Q *d*; for clearly M would have been the place of the centre of the epicycle at the end of a time proportional to D *d*, had it moved with an equable angular motion round E instead of Q. This angle *d* E M, or its equal E*d* Q, was called the equation of the centre (*i. e.* of the centre of the epicycle); and is clearly greater than if E Q, the excentricity of the equant, had been no greater than E C, called the excentricity of the orbit. The second equation was measured by the angle subtended at E by *d*, the centre of the epicycle, and *p* the planet's place in its circumference: it was called indifferently the equation of the orbit, or of the argument. In order to account for the apparent stations and retrogradations of the planets, it became necessary to suppose that many revolutions in the latter were completed during one of the former. The variations of latitude of the planets were exhibited by supposing not only that the planes of their deferents were oblique to the plane of the ecliptic, and that the plane of the epicycle was also oblique to that of the deferent, but that the inclination of the two latter was continually changing, although Kepler doubts whether this latter complication was admitted by Ptolemy. In the inferior planets, it was even thought necessary to give to the plane of the epicycle two oscillatory motions on axes at right angles to each other.

The astronomers at this period were much struck with a remarkable connexion between the revolutions of the superior planets in their epicycles, and the apparent motion of the sun; for when in conjunction with the sun, as seen from the earth, they were always found to be in the apogee, or point of greatest distance from the earth, of their epicycle; and when in opposition to the Sun, they were as regularly in the perigee, or point of nearest approach of the epicycle. This correspondence between two phenomena, which, according to the old astronomy, were entirely unconnected, was very perplexing, and it seems to have been one of the facts which led Copernicus to substitute the theory of the earth's motion round the sun.

As time wore on, the superstructure of excentrics and epicycles, which had been strained into representing the appearances of the heavens at a particular moment, grew out of shape, and the natural consequence of such an artificial system was, that it became next to impossible to foresee what ruin might be produced in a remote part of it by any attempt to repair the derangements and refit the parts to the changes, as they began to be remarked in any particular point. In the ninth century of our era, Ptolemy's tables were already useless, and all those that were contrived with unceasing toil to supply their place, rapidly became as unserviceable as they. Still the triumph of genius was seen in the veneration that continued to be paid to the assumptions of Ptolemy and Hipparchus; and even when the great reformer, Copernicus, appeared, he did not for a long time intend to do more than slightly modify their principles. That which he found difficult in the Ptolemaic system, was none of the inconveniences by which, since the establishment of the new system, it has become common to demonstrate the inferiority of the old one; it was the displacement of the centre of the equant from the centre of the orbit that principally indisposed him against it, and led him to endeavour to represent the appearances by some other combinations of really uniform circular motions.

There was an old system, called the Egyptian, according to which Saturn, Jupiter, Mars, and the Sun circulated round the earth, the sun carrying with it, as two moons or satellites, the other two planets, Venus and Mercury. This system had never entirely lost credit: it had been maintained in the fifth century by Martianus Capella*, and indeed it was almost sanctioned, though not formally taught, by Ptolemy himself, when he made the mean motion of the sun the same as that of the centres of the epicycles of both these planets. The remark which had also been made by the old astronomers, of the connexion between the motion of the sun and the revolutions of the superior planets in their epicycles, led him straight to the expectation that he might, perhaps, produce the uniformity he sought by extending the Egyptian system to these also, and this appears to have been the shape in which his reform was originally projected. It was already allowed that the centre of the orbits of all the planets was not coincident with the earth, but removed from it by the space E C. This first change merely made E C the same for all the planets, and equal to the mean distance of the earth from the sun. This system afterwards acquired great celebrity through its adoption by Tycho Brahe, who believed it originated with himself. It might perhaps have been at this period of his researches, that Copernicus was struck with the passages in the Latin and Greek authors, to which he refers as testifying the existence of an old belief in the motion of the earth round the sun. He immediately recognised how much this alteration would further his principles of uniformity, by referring all the planetary motions to one centre, and did not hesitate to embrace it. The idea of explaining the daily and principal apparent motions of the heavenly bodies by the revolution of the earth on its axis, would be the concluding change, and became almost a necessary consequence of his previous improvements, as it was manifestly at variance with his principles to give to all the planets and starry worlds a rapid daily motion round the centre of the earth, now that the latter was removed from its former supposed post in the centre of the universe, and was itself carried with an annual motion round another fixed point.

The reader would, however, form an inaccurate notion of the system of Copernicus, if he supposed that it comprised no more than the theory that each planet, including the earth among them, revolved in a simple circular orbit round the sun. Copernicus was too well acquainted with the motions of the heavenly bodies, not to be aware that such orbits would not accurately represent them; the motion he attributed to the earth round the sun, was at first merely intended to account for those which were called the second inequalities of the planets, according to which they appear one while to move forwards, then backwards, and at intermediate periods, stationary, and which thenceforward were also called the optical equations, as being merely an optical illusion. With regard to what were called the first inequalities, or physical equations, arising from a real inequality of motion, he still retained the machinery of the deferent and epicycle; and all the alteration he attempted in the orbits of the superior planets was an extension of the concentric theory to supply the place of the equant, which he considered the blot of the system. His theory for this purpose is shown in the accompanying diagram, where S represents the sun,



D*d*, the deferent or mean orbit of the

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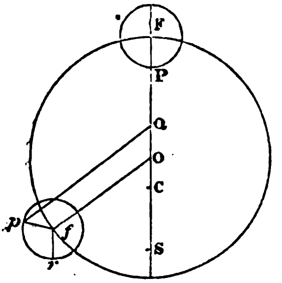
* Venus Mercuriusque, licet ortus occasusque quotidianos ostendunt, tamen eorum circuli terras omnino non ambiunt, sed circa solem laxiore ambitu circulantur. Denique circulorum suorum centron in sole constituunt.—De Nuptiis Philologiæ et Mercurii. Vicentiæ. 1499.

planet, on which revolves the centre of the great epicycle, whose radius, D F, was taken at $\frac{3}{4}$ of Ptolemy's excentricity of the equant; and round the circumference of this revolved, in the opposite direction, the centre of the little epicycle, whose radius, F P, was made equal to the remaining $\frac{1}{4}$ of the excentricity of the equant.

The planet P revolved in the circumference of the little epicycle, in the same direction with the centre of the great epicycle in the circumference of the deferent, but with a double angular velocity. The planet was supposed to be in the perigee of the little epicycle, when its centre was in the apogee of the greater; and whilst, for instance, D moved equably though the angle D S d, F moved through $h\,d\,f = \mathrm{D\,S}\,d$, and P through $r\,f\,p = 2\,\mathrm{DS}\,d$.

It is easy to show that this construction gives nearly the same result as Ptolemy's; for the deferent and great epicycle have been already shown exactly equivalent to an excentric circle round S, and indeed Copernicus latterly so represented it: the effect of his construction, as given above, may therefore be reproduced in the following simpler form, in which only the smaller epicycle is retained:



In this construction, the place of the planet is found at the end of any time proportional to F f, by drawing $f\,r$ parallel to SF, and taking $r\,f\,p = 2\,\mathrm{F}\,o\,f$. Hence it is plain, if we take O Q, equal to F P, (already assumed equal to $\frac{1}{4}$ of Ptolemy's excentricity of the equant,) since S O is equal to $\frac{3}{4}$ of the same, that S Q is the whole of Ptolemy's excentricity of the equant; and therefore, that Q is the position of the centre of his equant. It is also plain if we join Q p, since $r\,f\,p = 2\mathrm{F}\,o\,f$, and $o\,\mathrm{Q} = f\,p$,] that p Q is parallel to $f\,o$, and, therefore, p Q P is proportional to the time; so that the planet moves uniformly about the same point Q, as in Ptolemy's theory; and if we bisect S Q in C, which is the position of the centre of Ptolemy's deferent, the planet will, according to Copernicus, move very nearly, though not exactly, in the same circle, whose radius is C P, as that given by the simple excentric theory.

The explanation offered by Copernicus, of the motions of the inferior planets, differed again in form from that of the others. He here introduced what was called a *hypocycle*, which, in fact, was nothing but a deferent not including the sun, round which the centre of the orbit revolved. An epicycle in addition to the hypocycle was introduced into Mercury's orbit. In this epicycle he was not supposed to revolve, but to librate, or move up and down in its diameter. Copernicus had recourse to this complication to satisfy an erroneous assertion of Ptolemy with regard to some of Mercury's inequalities. He also retained the oscillatory motions ascribed by Ptolemy to the planes of the epicycles, in order to explain the unequal latitudes observed at the same distance from the nodes, or intersections of the orbit of the planet with the ecliptic. Into this intricacy, also, he was led by placing too much confidence in Ptolemy's observations, which he was unable to satisfy by an unvarying obliquity. Other very important errors, such as his belief that the line of nodes always coincided with the line of apsides, or places of greatest and least distance from the central body, (whereas, at that time, in the case of Mars, for instance, they were nearly 90° asunder,) prevented him from accurately representing many of the celestial phenomena.

These brief details may serve to show that the adoption or rejection of the theory of Copernicus was not altogether so simple a question as sometimes it may have been considered. It is, however, not a little remarkable, while it is strongly illustrative of the spirit of the times, that these very intricacies, with which Kepler's theories have enabled us to dispense, were the only parts of the system of Copernicus that were at first received with approbation. His theory of Mercury, especially, was considered a masterpiece of subtle invention. Owing to his dread of the unfavourable judgment he anticipated on the main principles of his system, his work remained unpublished during forty years, and was at last given to the world only just in time to allow Copernicus to receive the first copy of it a few hours before his death.

CHAPTER V.

Account of the Commentaries on the motions of Mars—Discovery of the Law of the equable description of Areas, and of Elliptic Orbits.

WE may now proceed to examine Kepler's innovations, but it would be doing injustice to one of the brightest points of his character, not to preface them by his own animated exhortation to his readers. "If any one be too dull to comprehend the science of astronomy, or too feeble-minded to believe in Copernicus without prejudice to his piety, my advice to such a one is, that he should quit the astronomical schools, and condemning, if he has a mind, any or all of the theories of philosophers, let him look to his own affairs, and leaving this worldly travail, let him go home and plough his fields: and as often as he lifts up to this goodly heaven those eyes with which alone he is able to see, let him pour out his heart in praises and thanksgiving to God the Creator; and let him not fear but he is offering a worship not less acceptable than his to whom God has granted to see yet more clearly with the eyes of his mind, and who both can and will praise his God for what he has so discovered."

Kepler did not by any means underrate the importance of his labours, as is sufficiently shewn by the sort of colloquial motto which he prefixed to his work. It consists in the first instance of an extract from the writings of the celebrated and unfortunate Peter Ramus. This distinguished philosopher was professor of mathematics in Paris, and in the passage in question, after calling on his contemporaries to turn their thoughts towards the establishment of a system of Astronomy unassisted by any hypothesis, he promised as an additional inducement to vacate his own chair in favour of any one who should succeed in this object. Ramus perished in the massacre of St. Bartholomew, and Kepler apostrophizes him as follows:—"It is well, Ramus, that you have forfeited your pledge, by quitting your life and professorship together: for if you still held it, I would certainly claim it as of right belonging to me on account of this work, as I could convince you even with your own logic." It was rather bold in Kepler to assert his claim to a reward held out for a theory resting on no hypothesis, by right of a work filled with hypotheses of the most startling description; but of the vast importance of this book there can be no doubt; and throughout the many wild and eccentric ideas to which we are introduced in the course of it, it is fit always to bear in mind that they form part of a work which is almost the basis of modern Astronomy."

The introduction contains a curious criticism of the commonly-received theory of gravity, accompanied with a declaration of Kepler's own opinions on the same subject. Some of the most remarkable passages in it have been already quoted in the life of Galileo; but, nevertheless, they are too important to Kepler's reputation to be omitted here, containing as they do a distinct and positive enunciation of the law of universal gravitation. It does not appear, however, that Kepler estimated rightly the importance of the theory here traced out by him, since on every other occasion he advocated principles with which it is scarcely reconcileable. The discussion is introduced in the following terms:—

"The motion of heavy bodies hinders many from believing that the earth is moved by an animal motion, or rather a magnetic one. Let such consider the following propositions. A mathematical point, whether the centre of the universe or not, has no power, either effectively or objectively, to move heavy bodies to approach it. Let physicians prove if they can, that such power can be possessed by a point, which neither is a body, nor is conceived unless by relation alone. It is impossible that the form* of a stone should, by moving its own body, seek a mathematical point, or in other words, the centre of the universe, without regard of the body in which that point exists. Let physicians prove if they can, that natural things have any sympathy with that which is nothing. Neither do heavy bodies tend to the centre of the universe by reason that they are avoiding the extremities of the round universe; for their distance from the centre is insensible, in proportion to their distance from the extremities of the universe. And what reason could there be for this hatred? How strong, how wise must those heavy bodies be, to be able to escape so carefully from an enemy lying on all sides of them: what activity in the extremities of the world to press their enemy so closely! Neither are heavy bodies driven into the centre by the whirling of the first moveable, as happens in revolving water. For if we assume such a motion, either it would not be continued down to us, or otherwise we should feel it, and be carried away with it, and the earth also with us; nay, rather, we should be hurried away first, and the earth would follow; all which conclusions are allowed by our opponents to be absurd. It is therefore plain that the vulgar theory of gravity is erroneous.

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* It is not very easy to carry the understanding aright among these Aristotelian ideas. Many at the present day might think they understood better what is meant, if for "form" had been written "nature."

The true theory of gravity is founded on the following axioms:—Every corporeal substance, so far forth as it is corporeal, has a natural fitness for resting in every place where it may be situated by itself beyond the sphere of influence of a body cognate with it. Gravity is a mutual affection between cognate bodies towards union or conjunction (similar in kind to the magnetic virtue), so that the earth attracts a stone much rather than the stone seeks the earth. Heavy bodies (if we begin by assuming the earth to be in the centre of the world) are not carried to the centre of the world in its quality of centre of the world, but as to the centre of a cognate round body, namely, the earth; so that wheresoever the earth may be placed, or whithersoever it may be carried by its animal faculty, heavy bodies will always be carried towards it. If the earth were not round, heavy bodies would not tend from every side in a straight line towards the centre of the earth, but to different points from different sides. If two stones were placed in any part of the world near each other, and beyond the sphere of influence of a third cognate body, these stones, like two magnetic needles, would come together in the intermediate point, each approaching the other by a space proportional to the comparative mass of the other. If the moon and earth were not retained in their orbits by their animal force or some other equivalent, the earth would mount to the moon by a fifty-fourth part of their distance, and the moon fall towards the earth through the other fifty-three parts and they would there meet; assuming however that the substance of both is of the same density. If the earth should cease to attract its waters to itself, all the waters of the sea would be raised and would flow to the body of the moon. The sphere of the attractive virtue which is in the moon extends as far as the earth, and entices up the waters; but as the moon flies rapidly across the zenith, and the waters cannot follow so quickly, a flow of the ocean is occasioned in the torrid zone towards the westward. If the attractive virtue of the moon extends as far as the earth, it follows with greater reason that the attractive virtue of the earth extends as far as the moon, and much farther; and in short, nothing which consists of earthly substance any how constituted, although thrown up to any height, can ever escape the powerful operation of this attractive virtue. Nothing which consists of corporeal matter is absolutely light, but that is comparatively lighter which is rarer, either by its own nature, or by accidental heat. And it is not to be thought that light bodies are escaping to the surface of the universe while they are carried upwards, or that they are not attracted by the earth. They are attracted, but in a less degree, and so are driven outwards by the heavy bodies; which being done, they stop, and are kept by the earth in their own place. But although the attractive virtue of the earth extends upwards, as has been said, so very far, yet if any stone should be at a distance great enough to become sensible, compared with the earth's diameter, it is true that on the motion of the earth such a stone would not follow altogether; its own force of resistance would be combined with the attractive force of the earth, and thus it would extricate itself in some degree from the motion of the earth."

Who, after perusing such passages in the works of an author, whose writings were in the hands of every student of astronomy, can believe that Newton waited for the fall of an apple to set him thinking for the first time on the theory which has immortalized his name? An apple may have fallen, and Newton may have seen it; but such speculations as those which it is asserted to have been the cause of originating in him had been long familiar to the thoughts of every one in Europe pretending to the name of natural philosopher.

As Kepler always professed to have derived his notion of a magnetic attraction among the planetary bodies from the writings of Gilbert, it may be worth while to insert here an extract from the "New Philosophy" of that author, to show in what form he presented a similar theory of the tides, which affords the most striking illustration of that attraction. This work was not published till the middle of the seventeenth century, but a knowledge of its contents may, in several instances, be traced back to the period in which it was written:—

"There are two primary causes of the motion of the seas—the moon, and the diurnal revolution. The moon does not act on the seas by its rays or its light. How then? Certainly by the common effort of the bodies, and (to explain it by something similar) by their magnetic attraction. It should be known, in the first place, that the whole quantity of water is not contained in the sea and rivers, but that the mass of earth (I mean this globe) contains moisture and spirit much deeper even than the sea. The moon draws this out by sympathy, so that they burst forth on the arrival of the moon, in consequence of the attraction of that star; and for the same reason, the quicksands which are in the sea open themselves more, and perspire their moisture and spirits during the flow of the tide, and the whirlpools in the sea disgorge copious waters; and as the star retires, they devour the same again, and attract the spirits and moisture of the terrestrial globe. Hence the moon attracts, not so much the sea as the subterranean spirits and humours; and the interposed earth has no more power of resistance than a table or any other dense body has to resist the force of a magnet. The sea rises from the greatest depths, in consequence of the ascending humours and spirits; and when it is raised up, it necessarily flows on to the shores, and from the shores it enters the rivers."*

This passage sets in the strongest light one of the most notorious errors of the older philosophy, to which Kepler himself was remarkably addicted. If Gilbert had asserted, in direct terms, that the moon attracted the water, it is certain that the notion would have been stigmatized (as it was for a long time in Newton's hands) as arbitrary, occult, and unphilosophical: the idea of these subterranean humours was likely to be treated with much more indulgence. A simple statement, that when the moon was over the water the latter had a tendency to rise towards it, was thought to convey no instruction; but the assertion that the moon draws out subterranean spirits by sympathy, carried with it a more imposing appearance of theory. The farther removed these humours were from common experience, the easier it became to discuss them in vague and general language; and those who called themselves philosophers could endure to hear attributes bestowed on these fictitious elements which revolted their imaginations when applied to things of whose reality at least some evidence existed.

It is not necessary to dwell upon the system of Tycho Brahe, which was identical, as we have said, with one rejected by Copernicus, and consisted in making the sun revolve about the earth, carrying with it all the other planets revolving about him. Tycho went so far as to deny the rotation of the earth to explain the vicissitudes of day and night, but even his favourite assistant Longomontanus differed from him in this part of his theory. The great merit of Tycho Brahe, and the service he rendered to astronomy, was entirely independent of any theory; consisting in the vast accumulation of observations made by him during a residence of fifteen years at Uraniburg, with the assistance of instruments, and with a degree of care, very far superior to anything known before his time in practical astronomy. Kepler is careful repeatedly to remind us, that without Tycho's observations he could have done nothing. The degree of reliance that might be placed on the results obtained by observers who acknowledged their inferiority to Tycho Brahe, may be gathered from an incidental remark of Kepler to Longomontanus. He had been examining Tycho's registers, and had occasionally found a difference amounting sometimes to 4′ in the right ascensions of the same planet, deduced from different stars on the same night. Longomontanus could not deny the fact, but declared that it was impossible to be always correct within such limits. The reader should never lose sight of this uncertainty in the observations, when endeavouring to estimate the difficulty of finding a theory that would properly represent them.

When Kepler first joined Tycho Brahe at Prague, he found him and Longomontanus very busily engaged in correcting the theory of Mars, and accordingly it was this planet to which he also first directed his attention. They had formed a catalogue of the mean oppositions of Mars during twenty years, and had discovered a position of the equant, which (as they said) represented them with tolerable exactness. On the other hand, they were much embarrassed by the unexpected difficulties they met in applying a system which seemed on the one hand so accurate, to the determination of the latitudes, with which it could in no way be made to agree. Kepler had already suspected the cause of this imperfection, and was confirmed in the view he took of their theory, when, on a more careful examination, he found that they overrated the accuracy even of their longitudes. The errors in these, instead of amounting as they said, nearly to 2′, rose sometimes above 21′. In fact they had reasoned ill on their own principles, and even if the foundations of their theory had been correctly laid, could not have arrived at true results. But Kepler had satisfied himself of the contrary, and the following diagram shews the nature of the first alteration he introduced, not perhaps so celebrated as some of his later discoveries, but at least of equal consequence to astronomy, which could never have been extricated from the confusion into which it had fallen, till this important change had been effected.

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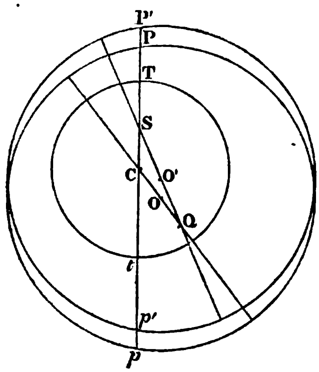
* De mundo nostro sublunari, Philosophia Nova. Amstelodami, 1651.

The practice of Tycho Brahe, indeed of all astronomers till the time of Kepler, had been to fix the position of the planet's orbit and equant from observations on its mean oppositions, that is to say, on the times when it was precisely six signs or half a circle distant from the mean place of the sun. In the annexed figure, let S represent the sun, C the centre of the earth's orbit, T *t*. Tycho Brahe's practice amounted to this, that if Q were supposed the place of the centre of the planet's equant, the centre of P *p* its orbit was taken in Q C, and not in Q S, as Kepler suggested that it ought to be taken. The consequence of this erroneous practice was, that the observations were deprived of the character for which oppositions were selected, of being entirely free from the second inequalities. It followed therefore that as part of the second inequalities were made conducive towards fixing the relative position of the orbit and equant, to which they did not naturally belong, there was an additional perplexity in accounting for the remainder of them by the size and motion of the epicycle. As the line of nodes of every planet was also made to pass through C instead of S, there could not fail to be corresponding errors in the latitudes. It would only be in the rare case of an opposition of the planet in the line C S, that the time of its taking place would be the same, whether O, the centre of the orbit, was placed in C Q or S Q. Every other opposition would involve an error, so much the greater as it was observed at a greater distance from the line C S.



It was long however before Tycho Brahe could be made to acquiesce in the propriety of the proposed alteration; and, in order to remove his doubts as to the possibility that a method could be erroneous which, as he still thought, had given him such accurate longitudes, Kepler undertook the ungrateful labour of the first part of his "Commentaries." He there shewed, in the three systems of Copernicus, Tycho Brahe, and Ptolemy, and in both the concentric and excentric theories, that though a false position were given to the orbit, the longitudes of a planet might be so represented, by a proper position of the centre of the equant, as never to err in oppositions above 5′ from those given by observation; though the second inequalities and the latitudes would thereby be very greatly deranged.

The change Kepler introduced, of observing apparent instead of mean oppositions, made it necessary to be very accurate in his reductions of the planet's place to the ecliptic; and in order to be able to do this, a previous knowledge of the parallax of Mars became indispensable. His next labour was therefore directed to this point; and finding that the assistants to whom Tycho Brahe had previously committed this labour had performed it in a negligent and imperfect manner, he began afresh with Tycho's original observations. Having satisfied himself as to the probable limits of his errors in the parallax on which he finally fixed, he proceeded to determine the inclination of the orbit and the position of the line of nodes. In all these operations his talent for astronomical inquiries appeared pre-eminent in a variety of new methods by which he combined and availed himself of the observations; but it must be sufficient merely to mention this fact, without entering into any detail. One important result may be mentioned, at which he arrived in the course of them, the constancy of the inclination of the planet's orbit, which naturally strengthened him in his new theory.

Having gone through these preliminary inquiries, he came at last to fix the proportions of the orbit; and, in doing so, he determined, in the first instance, not to assume, as Ptolemy appeared to have done arbitrarily, the bisection of the excentricity, but to investigate its proportion along with the other elements of the orbit, which resolution involved him in much more laborious calculations. After he had gone over all the steps of his theory no less than seventy times—an appalling labour, especially if we remember that logarithms were not then invented—his final result was, that in 1587, on the 6th of March, at 7^h 23′, the longitude of the aphelion of Mars was 4^s 28° 48′ 55″; that the planet's mean longitude was 6^s 0° 51′ 35″; that if the semidiameter of the orbit was taken at 100000, the excentricity was 11332; and the excentricity of the equant 18564. He fixed the radius of the greater epicycle at 14988, and that of the smaller at 3628.

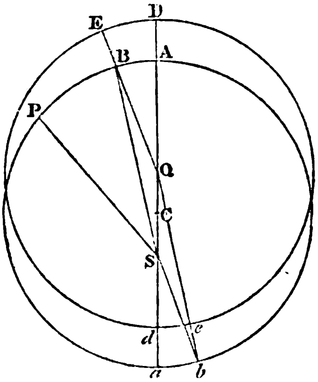
When he came to compare the longitudes as given by this, which he afterwards called the *vicarious* theory, with the observations at opposition, the result seemed to promise him the most brilliant success. His greatest error did not exceed 2′; but, notwithstanding these flattering anticipations, he soon found by a comparison of longitudes out of opposition and of latitudes, that it was yet far from being so complete as he had imagined, and to his infinite vexation he soon found that the labour of four years, which he had expended on this theory, must be considered almost entirely fruitless. Even his favourite principle of dividing the excentricity in a different ratio from Ptolemy, was found to lead him into greater error than if he had retained the old bisection. By restoring that, he made his latitudes more accurate, but produced a corresponding change for the worse in his longitudes; and although the errors of 8′, to which they now amounted, would probably have been disregarded by former theorists, Kepler could not remain satisfied till they were accounted for. Accordingly he found himself forced to the conclusion that one of the two principles on which this theory rested must be erroneous; either the orbit of the planet is not a perfect circle, or there is no fixed point within it round which it moves with an uniform angular motion. He had once before admitted the possibility of the former of these facts, conceiving it possible that the motion of the planets is not at all curvilinear, but that they move in polygons round the sun, a notion to which he probably inclined in consequence of his favourite harmonics and geometrical figures.

In consequence of the failure of a theory conducted with such care in all its practical details, Kepler determined that his next trial should be of an entirely different complexion. Instead of first satisfying the first inequalities of the planet, and then endeavouring to account for the second inequalities, he resolved to reverse the process, or, in other words, to ascertain as accurately as possible what part of the planet's apparent motion should be referred solely to the optical illusion produced by the motion of the earth, before proceeding to any inquiry of the real inequality of the planet's proper motion. It had been hitherto taken for granted, that the earth moved equably round the centre of its orbit; but Kepler, on resuming the consideration of it, recurred to an opinion he had entertained very early in his astronomical career (rather from his conviction of the existence of general laws, than that he had then felt the want of such a supposition), that it required an equant distinct from its orbit no less than the other planets. He now saw, that if this were admitted, the changes it would everywhere introduce in the optical part of the planet's irregularities might perhaps relieve him from the perplexity in which the vicarious theory had involved him. Accordingly he applied himself with renewed assiduity to the examination of this important question, and the result of his calculations (founded principally on observations of Mars' parallax) soon satisfied him not only that the earth's orbit does require such an equant, but that its centre is placed according to the general law of the bisection of the excentricity which he had previously found indispensable in the other planets. This was an innovation of the first magnitude, and accordingly Kepler did not venture to proceed farther in his theory, till by evidence of the most varied and satisfactory nature, he had established it beyond the possibility of cavil.

It may be here remarked, that this principle of the bisection of the eccentricity, so familiar to the Ptolemaic astronomers, is identical with the theory afterwards known by the name of the simple elliptic hypothesis, advocated by Seth Ward and others. That hypothesis consisted in supposing the sun to be placed in one focus of the elliptic orbit of the planet, whose angular motion was uniform round the other focus. In Ptolemaic phraseology, that other focus was the centre of the equant, and it is well known that the centre of the ellipse lies in the middle point between the two foci.

It was at this period also, that Kepler first ventured upon the new method of representing inequalities which terminated in one of his most celebrated discoveries. We have already seen, in the account of the "Mysterium Cosmographicum," that he was speculating, even at that time, on the effects of a whirling force exerted by the sun on the planets with diminished energy at increased distances, and on the proportion observed between the distances of the planets from the sun, and their periods of revolution. He seems even then to have believed in the possibility of discovering a relation between the times and distances in different planets. Another analogous consequence of his theory of the radiation of the whirling force would be, that if the same planet should recede to a greater distance from the central body, it would be acted on by a diminished energy of revolution, and consequently, a relation might be found between the velocity at any point of its orbit, and its distance at that point from the sun. Hence he expected to derive a more direct and natural method of calculating the inequalities, than from the imaginary equant. But these ingenious ideas had been checked in the outset by the erroneous belief which Kepler, in common with other astronomers, then entertained of the coincidence of the earth's equant with its orbit; in other words, by the belief that the earth's linear motion was uniform, though it was known not to remain constantly at the same distance from the sun. As soon as this prejudice was removed, his former ideas recurred to him with increased force, and he set himself diligently to consider what relation could be found between the velocity and distance of a planet from the sun. The method he adopted in the beginning of this inquiry was to assume as approximately correct Ptolemy's doctrine of the bisection of the excentricity, and to investigate some simple relation nearly representing the same effect.

In the annexed figure, S is the place of the sun, C the centre of the planet's orbit A B *a b*, Q the centre of the equant represented by the equal circle D E *d e*, A B, *a b*, two equal small arcs described by the planet at the apsides of its orbit: then, according to Ptolemy's principles, the arc D E of the equant would be proportional to the time of passing along A B, on the same scale on which *d e* would represent the time of passing through the equal arc *a b*.



$QD : QA :: DE : AB$, nearly; and because QS is bisected in C, QA, CA or QD, and SA, are in arithmetical proportion: and, therefore, since an arithmetical mean, when the difference is small, does not differ much from a geometrical mean, $QD : QA :: SA : QD$, nearly. Therefore, $DE : AB :: SA : QD$, nearly, and in the same manner $de : ab :: Sa : Qd$ nearly; and therefore $DE : de :: SA : Sa$ nearly. Therefore at the apsides, the times of passing over equal spaces, on Ptolemy's theory, are nearly as the distances from the sun, and Kepler, with his usual hastiness, immediately concluded that this was the accurate and general law, and that the errors of the old theory arose solely from having departed from it.

It followed immediately from this assumption, that after leaving the point A, the time in which the planet would arrive at any point P of its orbit would be proportional to, and might be represented by, the sums of all the lines that could be drawn from S to the arc A P, on the same scale that the whole period of revolution would be denoted by the sum of all the lines drawn to every point of the orbit. Kepler's first attempt to verify this supposition approximately, was made by dividing the whole circumference of the orbit into 360 equal parts, and calculating the distances at every one of the points of division. Then supposing the planet to move uniformly, and to remain at the same distance from the sun during the time of passing each one of these divisions, (a supposition which manifestly would not differ much from the former one, and would coincide with it more nearly, the greater was the number of divisions taken) he proceeded to add together these calculated distances, and hoped to find that the time of arriving at any one of the divisions bore the same ratio to the whole period, as the sum of the corresponding set of distances did to the sum of the whole 360.

This theory was erroneous; but by almost miraculous good fortune, he was led by it in the following manner to the true measure. The discovery was a consequence of the tediousness of his first method, which required, in order to know the time of arriving at any point, that the circle should be subdivided, until one of the points of division fell exactly upon the given place. Kepler therefore endeavoured to discover some shorter method of representing these sums of the distances. The idea then occurred to him of employing for that purpose the area inclosed between the two distances, S A, S P, and the arc A P, in imitation of the manner in which he remembered that Archimedes had found the area of the circle, by dividing it into an infinite number of small triangles by lines drawn from the centre. He hoped therefore to find, that the time of passing from A to P bore nearly the same ratio to the whole period of revolution that the area A S P bore to the whole circle.

This last proportion is in fact accurately observed in the revolution of one body round another, in consequence of an attractive force in the central body. Newton afterwards proved this, grounding his demonstration upon laws of motion altogether irreconcileable with Kepler's opinions; and it is impossible not to admire Kepler's singular good fortune in arriving at this correct result in spite, or rather through the means, of his erroneous principles. It is true that the labour which he bestowed unsparingly upon every one of his successive guesses, joined with his admirable candour, generally preserved him from long retaining a theory altogether at variance with observations; and if any relation subsisted between the times and distances which could any way be expressed by any of the geometrical quantities under consideration, he could scarcely have failed—it might be twenty years earlier or twenty years later,—to light upon it at last, having once put his indefatigable fancy upon this scent. But in order to prevent an over-estimate of his merit in detecting this beautiful law of nature, let us for a moment reflect what might have been his fate had he endeavoured in the same manner, and with the same perseverance, to discover a relation, where, in reality, none existed. Let us take for example the inclinations or the excentricities of the planetary orbits, among which no relation has yet been discovered; and if any exists, it is probably of too complicated a nature to be hit at a venture. If Kepler had exerted his ingenuity in this direction, he might have wasted his life in fruitless labour, and whatever reputation he might have left behind him as an industrious calculator, it would have been very far inferior to that which has procured for him the proud title of the "Legislator of the Heavens."

However this may be, the immediate consequence of thus lighting upon the real law observed by the earth in its passage round the sun was, that he found himself in possession of a much more accurate method of representing its inequalities than had been reached by any of his predecessors; and with renewed hopes he again attacked the planet Mars, whose path he was now able to consider undistorted by the illusions arising out of the motion of the earth. Had the path of Mars been accurately circular, or even as nearly approaching a circle as that of the earth, the method he chose of determining its position and size by means of three distances carefully calculated from his observed parallaxes, would have given a satisfactory result; but finding, as he soon did, that almost every set of three distances led him to a different result, he began to suspect another error in the long-received opinion, that the orbits of the planets must consist of a combination of circles; he therefore determined, in the first instance, to fix the distances of the planet at the apsides without any reference to the form of the intermediate orbit. Half the difference between these would, of course, be the excentricity of the orbit; and as this quantity came out very nearly the same as had been determined on the vicarious theory, it seemed clear that the error of that theory, whatever it might be, did not lie in these elements.

Kepler also found that in the case of this planet likewise, the times of describing equal arcs at the apsides were proportional to its distances from the sun, and he naturally expected that the method of areas would measure the planet's motion with as much accuracy as he had found in the case of the earth. This hope was disappointed: when he calculated the motion of the planet by this method, he obtained places too much advanced when near the apsides, and too little advanced at the mean distances. He did not, on that account, immediately reject the opinion of circular orbits, but was rather inclined to suspect the principle of measurement, at which he felt that he had arrived in rather a precarious manner. He was fully sensible that his areas did not accurately represent the sums of any distances except those measured from the centre of the circle; and for some time he abandoned the hope of being able to use this substitution, which he always considered merely as an approximate representation of the true measure, the sum of the distances. But on examination he found that the errors of this substitution were nearly insensible, and those it did in fact produce, were in the contrary direction of the errors he was at this time combating. As soon as he had satisfied himself of this, he ventured once more on the supposition, which by this time had, in his eyes, almost acquired the force of demonstration, that the orbits of the planets are not circular, but of an oval form, retiring within the circle at the mean distances, and coinciding with it at the apsides.

This notion was not altogether new; it had been suggested in the case of Mercury, by Purbach, in his "Theories of the Planets." In the edition of this work published by Reinhold, the pupil of Copernicus, we read the following passage. "Sixthly, it appears from what has been said, that the centre of Mercury's epicycle, by reason of the motions above-mentioned, does not, as is the case with the other planets, describe the circumference of a circular deferent, but rather the periphery of a figure resembling a plane oval." To this is added the following note by Reinhold. "The centre of the Moon's epicycle describes a path of a lenticular shape; Mercury's on the contrary is egg-shaped, the big end lying towards his apogee, and the little end towards his perigee*." The excentricity of Mercury's orbit is, in fact, much greater than that of any of the other planets, and the merit of making this first step cannot reasonably be withheld from Purbach and his commentator, although they did not pursue the inquiry so far as Kepler found himself in a condition to do.

Before proceeding to the consideration of the particular oval which Kepler fixed upon in the first instance, it will be necessary, in order to render intelligible the source of many of his doubts and difficulties, to make known something more of his theory of the moving force by which he supposed the planets to be carried round in their orbits. In conformity with the plan hitherto pursued, this shall be done as much as possible in his own words.

"It is one of the commonest axioms in natural philosophy, that if two things always happen together and in the same manner, and admit the same measure, either the one is the cause of the other, or both are the effect of a common cause. In the present case, the increase or languor of motion invariably corresponds with an approach to or departure from the centre of the universe. Therefore, either the languor is the cause of the departure of the star, or the departure of the languor, or both have a common cause. But no one can be of opinion that there is a concurrence of any third thing to be a common cause of these two effects, and in the following chapters it will be made clear that there is no occasion to imagine any such third thing, since the two are of themselves sufficient. Now, it is not agreeable to the nature of things that activity or languor in linear motion should be the cause of distance from the centre. For, distance from the centre is conceived anteriorly to linear motion. In fact linear motion cannot exist without distance from the centre, since it requires space for its accomplishment, but distance from the centre can be conceived without motion. Therefore distance is the cause of the activity of motion, and a greater or less distance of a greater or less delay. And since distance is of the kind of relative quantities, whose essence consists in boundaries, (for there is no efficacy in relation *per se* without regard to bounds,) it follows that the cause of the varying activity of motion rests in one of the boundaries. But the body of the planet neither becomes heavier by receding, nor lighter by approaching. Besides, it would perhaps be absurd on the very mention of it, that an animal force residing in the moveable body of the planet for the purpose of moving it, should exert and relax itself so often without weariness or decay. It remains, therefore, that the cause of this activity and languor resides at the other boundary, that is, in the very centre of the world, from which the distances are computed.—Let us continue our investigation of this moving virtue which resides in the sun, and we shall presently recognize its very close analogy to light. And although this moving virtue cannot be identical with the light of the sun, let others look to it whether the light is employed as a sort of instrument, or vehicle, to convey the moving virtue. There are these seeming contradictions:—first, light is obstructed by opaque bodies, for which reason if the moving virtue travelled on the light, darkness would be followed by a stoppage of the moveable bodies. Again, light flows out in right lines spherically, the moving virtue in right lines also, but cylindrically: that is, it turns in one direction only, from west to east; not in the opposite direction, not towards the poles, &c. But perhaps we shall be able presently to reply to these objections. In conclusion, since there is as much virtue in a large and remote circle as in a narrow and close one, nothing of the virtue perishes in the passage from its source, nothing is scattered between the source and the moveable. Therefore the efflux, like that of light, is not material, and is unlike that of odours, which are accompanied by a loss of substance, unlike heat from a raging furnace, unlike every other emanation by which mediums are filled. It remains, therefore, that as light which illuminates all earthly things, is the immaterial species of that fire which is in the body of the sun, so this virtue, embracing and moving all the planetary bodies, is the immaterial species of that virtue which resides in the sun itself, of incalculable energy, and so the primary act of all mundane motion.—I should like to know who ever said that there was anything material in light!—Guided by our notion of the efflux of this species (or archetype), let us contemplate the more intimate nature of the source itself. For it seems as if something divine were latent in the body of the sun, and comparable to our own soul, whence that species emanates which drives round the planets; just as from the mind of a slinger the species of motion sticks to the stones, and carries them forward, even after he who cast them has drawn back his hand. But to those who wish to proceed soberly, reflections differing a little from these will be offered."

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* Theoricæ novæ planetarum. G. Purbachii, Parisiis, 1553.

Our readers will, perhaps, be satisfied with the assurance, that these sober considerations will not enable them to form a much more accurate notion of Kepler's meaning than the passages already cited. We shall therefore proceed to the various opinions he entertained on the motion of the planets.

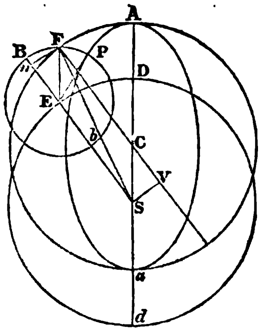
He considered it as established by his theory, that the centre E of the planet's epicycle (see fig. p. 33.) moved round the circumference of the deferent D*d*, according to the law of the planet's distances; the point remaining to be settled was the motion of the planet in the epicycle. If it were made to move according to the same law, so that when the centre of the epicycle reached E, the planet should be at F, taking the angle BEF equal to BSA, it has been shewn (p. 19) that the path of F would still be a circle, excentric from D*d* by DA the radius of the epicycle.

But Kepler fancied that he saw many sound reasons why this could not be the true law of motion in the epicycle, on which reasons he relied much more firmly than on the indisputable fact, which he mentions as a collateral proof, that it was contradicted by the observations. Some of these reasons are subjoined: "In the beginning of the work it has been declared to be most absurd, that a planet (even though we suppose it endowed with mind) should form any notion of a centre, and a distance from it, if there be no body in that centre to serve for a distinguishing mark. And although you should say, that the planet has respect to the sun, and knows beforehand, and remembers the order in which the distances from the sun are comprised, so as to make a perfect excentric; in the first place, this is rather far-fetched, and requires, in any mind, means for connecting the effect of an accurately circular path with the sign of an increasing and diminishing diameter of the sun. But there are no such means, except the position of the centre of the excentric at a given distance from the sun; and I have already said, that this is beyond the power of a mere mind. I do not deny that a centre may be imagined, and a circle round it; but this I do say, if the circle exists only in imagination, with no external sign or division, that it is not possible that the path of a moveable body should be really ordered round it in an exact circle. Besides, if the planet chooses from memory its just distances from the sun, so as exactly to form a circle, it must also take from the same source, as if out of the Prussian or Alphonsine tables, equal excentric arcs, to be described in unequal times, and to be described by a force extraneous from the sun; and thus would have, from its memory, a foreknowledge of what effects a virtue, senseless and extraneous from the sun, was about to produce: all these consequences are absurd."

"It is therefore more agreeable to reason that the planet takes no thought, either of the excentric or epicycle; but that the work which it accomplishes, or joins in effecting, is a libratory path in the diameter B *b* of the epicycle, in the direction towards the sun. The law is now to be discovered, according to which the planet arrives at the proper distances in any time. And indeed in this inquiry, it is easier to say what the law is not than what it is."—Here, according to his custom, Kepler enumerates several laws of motion by which the planet might choose to regulate its energies, each of which is successively condemned. Only one of them is here mentioned, as a specimen of the rest. "What then if we were to say this? Although the motions of the planet are not epicyclical, perhaps the libration is so arranged that the distances from the sun are equal to what they would have been in a real epicyclical motion.—This leads to more incredible consequences than the former suppositions, and yet in the dearth of better opinions, let us for the present content ourselves with this. The greater number of absurd conclusions it will be found to involve, the more ready will a physician be, when we come to the fifty-second chapter, to admit what the observations testify, that the path of the planet is not circular."

The first oval path on which Kepler was induced to fix, by these and many other similar considerations, was in the first instance very different from the true elliptical form. Most authors would have thought it unnecessary to detain their readers with a theory which they had once entertained and rejected; but Kepler's work was written on a different plan. He thus introduces an explanation of his first oval. "As soon as I was thus taught by Brahe's very accurate observations that the orbit of a planet is not circular, but more compressed at the sides, on the instant I thought that I understood the natural cause of this deflection. But the old proverb was verified in my case;—the more haste the less speed.—For having violently laboured in the 39th chapter, in consequence of my inability to find a sufficiently probable cause why the orbit of the planet should be a perfect circle, (some absurdities always remaining with respect to that virtue which resides in the body of the planet,) and having now discovered from the observations, that the orbit is not a perfect circle, I felt furiously inclined to believe that if the theory which had been recognized as absurd, when employed in the 39th chapter for the purpose of fabricating a circle, were modulated into a more probable form, it would produce an accurate orbit agreeing with the observations. If I had entered on this course a little more warily, I might have detected the truth immediately. But, being blinded by my eagerness, and not sufficiently regardful of every part of the 39th chapter, and clinging to my first opinion, which offered itself to me with a wonderful show of probability, on account of the equable motion in the epicycle, I got entangled in new perplexities, with which we shall now have to struggle in this 45th chapter and the following ones as far as the 50th chapter."

In this theory, Kepler supposed that whilst the centre of the epicycle was moving round a circular deferent according to the law of the planets' distances (or areas) the planet itself moved equably in the epicycle, with the mean angular velocity of its centre in the deferent. In consequence of this supposition, since



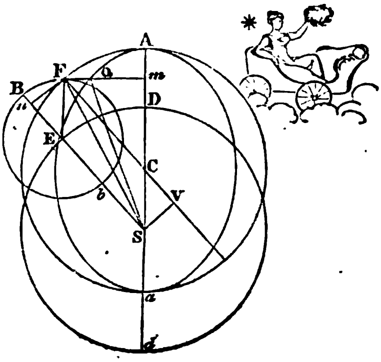
at D, when the planet is at A the aphelion, the motion in the deferent is less than the mean motion, the planet will have advanced through an angle B E P greater than B E F or B S A, through which the centre of the epicycle has moved; and consequently, the path will lie everywhere within the circle A *a*, except at the apsides. Here was a new train of laborious calculations to undergo for the purpose of drawing the curve A P *a* according to this law, and of measuring the area of any part of it. After a variety of fruitless attempts, for this curve is one of singular complexity, he was reduced, as a last resource, to suppose it insensibly different from an ellipse on the same principal axes, as an approximate means of estimating its area. Not content even with the results so obtained, and not being able to see very clearly what might be the effect of his alteration in substituting the ellipse for the oval, and in other simplifications introduced by him, he had courage enough to obtain the sums of the 360 distances by direct calculation, as he had done in the old circular theory.

In the preface to his book he had spoken of his labours under the allegory of a war carried on by him against the planet; and when exulting in the early prospects of success this calculation seemed to offer, he did not omit once more to warn his readers, in his peculiar strain, that this exultation was premature.

"Allow me, gentle reader, to enjoy so splendid a triumph for one little day (I mean through the five next chapters), meantime be all rumours suppressed of new rebellion, that our preparations may not perish, yielding us no delight. Hereafter if anything shall come to pass, we will go through it in its own time and season; now let us be merry, as then we will be bold and vigorous." At the time foretold, that is to say, at the end of the five merry chapters, the bad news could no longer be kept a secret. It is announced in the following bulletin:—"While thus triumphing over Mars, and preparing for him, as for one altogether vanquished, tabular prisons, and equated eccentric fetters, it is buzzed here and there that the victory is vain, and that the war is raging anew as violently as before. For the enemy, left at home a despised captive, has burst all the chains of the equations, and broken forth of the prisons of the tables. For no method of geometrically administering the theory of the 45th chapter was able to come near the accuracy of approximation of the vicarious theory of the 16th chapter, which gave me true equations derived from false principles. Skirmishers, disposed all round the circuit of the excentric, (I mean the true distances,) routed my forces of physical causes levied out of the 45th chapter, and shaking off the yoke, regained their liberty. And now there was little to prevent the fugitive enemy from effecting a junction with his rebellious supporters, and reducing me to despair, had I not suddenly sent into the field a reserve of new physical reasonings on the rout and dispersion of the veterans, and diligently followed, without allowing him the slightest respite, in the direction in which he had broken out."

In plainer terms, Kepler found, after this labour was completed, that the errors in longitude he was still subject to were precisely of an opposite nature to those he had found with the circle; instead of being too quick at the apsides, the planet was now too slow there, and too much accelerated in the mean distances; and the distances obtained from direct observation were everywhere greater, except at the apsides, than those furnished by this oval theory. It was in the course of these tedious investigations that he established, still more satisfactorily than he had before done, that the inclinations of the planets' orbits are invariable, and that the lines of their nodes pass through the centre of the Sun, and not, as before his time had been supposed, through the centre of the ecliptic.

When Kepler found with certainty that this oval from which he expected so much would not satisfy the observations, his vexation was extreme, not merely from the mortification of finding a theory confuted on which he had spent such excessive labour, for he was accustomed to disappointments of that kind, but principally from many anxious and fruitless speculations as to the real physical causes why the planet did not move in the supposed epicycle, that being the point of view, as has been already shewn, from which he always preferred to begin his inquiries. One part of the reasoning by which he reconciled himself to the failure exhibits much too curious a view of the state of his mind to be passed over in silence. The argument is founded on the difficulty which he met with, as abovementioned, in calculating the proportions of the oval path he had imagined. "In order that you may see the cause of the impracticability of this method which we have just gone through, consider on what foundations it rests. The planet is supposed to move equably in the epicycle, and to be carried by the Sun unequably in the proportion of the distances. But by this method it is impossible to be known how much of the oval path corresponds to any given time, although the distance at that part is known, unless we first know the length of the whole oval. But the length of the oval cannot be known, except from the law of the entry of the planet within the sides of the circle. But neither can the law of this entry be known before we know how much of the oval path corresponds to any given time. Here you see that there is a *petitio principii;* and in my operations I was assuming that of which I was in search, namely, the length of the oval. This is at least not the fault of my understanding, but it is also most alien to the primary Ordainer of the planetary courses: I have never yet found so ungeometrical a contrivance in his other works. Therefore we must either hit upon some other method of reducing the theory of the 45th chapter to calculation; or if that cannot be done, the theory itself, suspected on account of this *petitio principii,* will totter." Whilst his mind was thus occupied, one of those extraordinary accidents which it has been said never occur but to those capable of deriving advantage from them (but which, in fact, are never noticed when they occur to any one else), fortunately put him once more upon the right path. Half the extreme breadth between the oval and the circle nearly represented the errors of his distances at the mean point, and he found that this half was 429 parts of a radius, consisting of 100000 parts; and happening to advert to the greatest optical inequality of Mars, which amounts to about 5° 18′, it struck him that 429 was precisely the excess of the secant of 5° 18′ above the radius taken at 100000. This was a ray of light, and, to use his own words, it roused him as out of sleep. In short, this single observation was enough to produce conviction in his singularly constituted mind, that instead of the distances S F, he should everywhere substitute F V, determined by drawing S V perpendicular on the line F C, since the excess of S F above F V is manifestly that of the secant above the radius in the optical equation S F C at that point. It is still more extraordinary that a substitution made for such a reason should have the luck, as is again the case, to be the right one. This substitution in fact amounted to supposing that the planet, instead of being at the distance S P or S F, was at S *n*; or, in other words, that instead of revolving in the circumference, it librated in the diameter of the epicycle, which was to him an additional recommendation. Upon this new supposition a fresh set of distances was rapidly calculated, and to Kepler's inexpressible joy, they were found to agree with the observations within the limits of the errors to which the latter were necessarily subject. Notwithstanding this success, he had to undergo, before arriving at the successful termination of his labours, one more disappointment. Although the distance corresponding to a time from the aphelion represented approximately by the area A S F, was thus found to be accurately represented by the line S *n*, there was still an error with regard to the direction in which that distance was to be measured. Kepler's first idea was to set it off in the direction S F, but this he found to lead to inaccurate longitudes;



and it was not until after much perplexity, driving him, as he tells us, "almost to insanity," that he satisfied himself that the distance S Q equal to F V ought to be taken terminating in F *m*, the line from F perpendicular to A *a*, the line of apsides, and that the curve so traced out by Q would be an accurate ellipse.

He then found to his equal gratification and amazement, a small part of which he endeavoured to express by a triumphant figure on the side of his diagram, that the error he had committed in taking the area A S F to represent the sums of the distances S F, was exactly counterbalanced; for this area does accurately represent the sums of the distances F V or S Q. This compensation, which seemed to Kepler the greatest confirmation of his theory, is altogether accidental and immaterial, resulting from the relation between the ellipse and circle. If the laws of planetary attraction had chanced to have been any other than those which cause them to describe ellipses, this last singular confirmation of an erroneous theory could not have taken place, and Kepler would have been forced either to abandon the theory of the areas, which even then would have continued to measure and define their motions, or to renounce the physical opinions from which he professed to have deduced it as an approximative truth.

These are two of the three celebrated theorems called Kepler's laws: the first is, that the planets move in ellipses round the sun, placed in the focus; the second, that the time of describing any arc is proportional in the same orbit to the area included between the arc and the two bounding distances from the sun. The third will be mentioned on another occasion, as it was not discovered till twelve years later. On the establishment of these two theorems, it became important to discover a method of measuring such elliptic areas, but this is a problem which cannot be accurately solved. Kepler, in offering it to the attention of geometricians, stated his belief that its solution was unattainable by direct processes, on account of the incommensurability of the arc and sine, on which the measurement of the two parts A Q *m*, S Q *m* depends. "This," says he in conclusion, "this is my belief, and whoever shall shew my mistake, and point out the true solution,

Is erit mihi magnus Apollonius."

CHAPTER VI.

Kepler appointed Professor at Linz—His second marriage—Publishes his new Method of Gauging—Refuses a Professorship at Bologna.

WHEN presenting this celebrated book to the emperor, Kepler gave notice that he contemplated a farther attack upon Mars's relations, father Jupiter, brother Mercury, and the rest; and promised that he would be successful, provided the emperor would not forget the sinews of war, and order him to be furnished anew with means for recruiting his army. The death of his unhappy patron, the Emperor Rodolph, which happened in 1612, barely in time to save him from the last disgrace of deposition from the Imperial throne, seemed to put additional difficulties in the way of Kepler's receiving the arrears so unjustly denied to him; but on the accession of Rodolph's brother, Matthias, he was again named to his post of Imperial Mathematician, and had also a permanent professorship assigned to him in the University of Linz. He quitted Prague without much regret, where he had struggled against poverty during eleven years. Whatever disinclination he might feel to depart, arose from his unwillingness to loosen still more the hold he yet retained upon the wreck of Tycho Brahe's instruments and observations. Tengnagel, son-in-law of Tycho, had abandoned astronomy for a political career, and the other members of his family, who were principally females, suffered the costly instruments to lie neglected and forgotten, although they had obstructed with the utmost jealousy Kepler's attempts to continue their utility. The only two instruments Kepler possessed of his own property, were "An iron sextant of 2½ feet diameter, and a brass azimuthal quadrant, of 3½ feet diameter, both divided into minutes of a degree." These were the gift of his friend and patron, Hoffman, the President of Styria, and with these he made all the observations which he added to those of Tycho Brahe. His constitution was not favourable to these studies, his health being always delicate, and suffering much from exposure to the night air; his eyes also were very weak, as he mentions himself in several places. In the summary of his character which he drew up when proposing to become Tycho Brahe's assistant, he describes himself as follows:—"For observations my sight is dull; for mechanical operations my hand is awkward; in politics and domestic matters my nature is troublesome and choleric; my constitution will not allow me, even when in good health, to remain a long time sedentary (particularly for an extraordinary time after dinner); I must rise often and walk about, and in different seasons am forced to make corresponding changes in my diet."

The year preceding his departure to Linz was denounced by him as pregnant with misfortune and misery. "In the first place I could get no money from the court, and my wife, who had for a long time been suffering under low spirits and despondency, was taken violently ill towards the end of 1610, with the Hungarian fever, epilepsy, and phrenitis. She was scarcely convalescent when all my three children were at once attacked with small-pox. Leopold with his army occupied the town beyond the river, just as I lost the dearest of my sons, him whose nativity you will find in my book on the new star. The town on this side of the river where I lived was harassed by the Bohemian troops, whose new levies were insubordinate and insolent: to complete the whole, the Austrian army brought the plague with them into the city. I went into Austria, and endeavoured to procure the situation which I now hold. Returning in June, I found my wife in a decline from her grief at the death of her son, and on the eve of an infectious fever; and I lost her also, within eleven days after my return. Then came fresh annoyance, of course, and her fortune was to be divided with my step-sisters. The Emperor Rodolph would not agree to my departure; vain hopes were given me of being paid from Saxony; my time and money were wasted together, till on the death of the emperor, in 1612, I was named again by his successor, and suffered to depart to Linz. These, methinks, were reasons enough why I should have overlooked not only your letters, but even astronomy itself."

Kepler's first marriage had not been a happy one; but the necessity in which he felt himself of providing some one to take charge of his two surviving children, of whom the eldest, Susanna, was born in 1602, and Louis in 1607, determined him on entering a second time into the married state. The account he has left us of the various negotiations which preceded his final choice, does not, in any point, belie the oddity of his character. His friends seem to have received a general commission to look out for a suitable match, and in a long and most amusing letter to the Baron Strahlendorf, we are made acquainted with the pretensions and qualifications of no less than eleven ladies among whom his inclinations wavered.

The first on the list was a widow, an intimate friend of his first wife's, and who, on many accounts, appeared a most eligible match. "At first she seemed favourably inclined to the proposal; it is certain that she took time to consider it, but at last she very quietly excused herself." It must have been from a recollection of this lady's good qualities that Kepler was induced to make his offer; for we learn rather unexpectedly, after being informed of her decision, that when he soon afterwards paid his respects to her, it was for the first time that he had seen her during the last six years; and he found, to his great relief, that "there was no single pleasing point about her." The truth seems to be that he was nettled by her answer, and he is at greater pains than appear necessary, considering this last discovery, to determine why she would not accept his offered hand. Among other reasons he suggested her children, among whom were two marriageable daughters; and it is diverting afterwards to find them also in the catalogue which Kepler appeared to be making of all his female acquaintance. He seems to have been much perplexed in attempting to reconcile his astrological theory with the fact of his having taken so much trouble about a negotiation not destined to succeed. "Have the stars exercised any influence here? For just about this time the direction of the Mid-Heaven is in hot opposition to Mars, and the passage of Saturn, through the ascending point of the zodiac, in the scheme of my nativity, will happen again next November and December. But if these are the causes, how do they act? Is that explanation the true one which I have elsewhere given? For I can never think of handing over to the stars the office of deities to produce effects. Let us therefore suppose it accounted for by the stars, that at this season I am violent in my temper and affections, in rashness of belief, in a shew of pitiful tenderheartedness; in catching at reputation by new and paradoxical notions, and the singularity of my actions; in busily inquiring into, and weighing and discussing, various reasons; in the uneasiness of my mind with respect to my choice. I thank God that that did not happen which might have happened; that this marriage did not take place: now for the others." Of these others, one was too old, another in bad health, another too proud of her birth and quarterings; a fourth had learned nothing but shewy accomplishments, "not at all suitable to the sort of life she would have to lead with me." Another grew impatient, and married a more decided admirer, whilst he was hesitating. "The mischief (says he) in all these attachments was, that whilst I was delaying, comparing, and balancing conflicting reasons, every day saw me inflamed with a new passion." By the time he reached the eighth, he found his match in this respect. "Fortune at length has avenged herself on my doubtful inclinations. At first she was quite complying, and her friends also: presently, whether she did or did not consent, not only I, but she herself did not know. After the lapse of a few days, came a renewed promise, which however had to be confirmed a third time; and four days after that, she again repented her confirmation, and begged to be excused from it. Upon this I gave her up, and this time all my counsellors were of one opinion." This was the longest courtship in the list, having lasted three whole months; and quite disheartened by its bad success, Kepler's next attempt was of a more timid complexion. His advances to No. 9, were made by confiding to her the whole story of his recent disappointment, prudently determining to be guided in his behaviour, by observing whether the treatment he had experienced met with a proper degree of sympathy. Apparently the experiment did not succeed; and almost reduced to despair, Kepler betook himself to the advice of a friend, who had for some time past complained that she was not consulted in this difficult negotiation. When she produced No. 10, and the first visit was paid, the report upon her was as follows:—"She has, undoubtedly, a good fortune, is of good family, and of economical habits: but her physiognomy is most horribly ugly; she would be stared at in the streets, not to mention the striking disproportion in our figures. I am lank, lean, and spare; she is short and thick: in a family notorious for fatness she is considered superfluously fat." The only objection to No. 11 seems to have been her excessive youth; and when this treaty was broken of on that account, Kepler turned his back upon all his advisers, and chose for himself one who had figured as No. 5 in the list, to whom he professes to have felt attached throughout, but from whom the representations of his friends had hitherto detained him, probably on account of her humble station.

The following is Kepler's summary of her character. "Her name is Susanna, the daughter of John Reuthinger and Barbara, citizens of the town of Eferdingen; the father was by trade a cabinet-maker, but both her parents are dead. She has received an education well worth the largest dowry, by favour of the Lady of Stahrenberg, the strictness of whose household is famous throughout the province. Her person and manners are suitable to mine; no pride, no extravagance; she can bear to work; she has a tolerable knowledge how to manage a family; middle-aged, and of a disposition and capability to acquire what she still wants. Her I shall marry by favour of the noble baron of Stahrenberg at twelve o'clock on the 30th of next October, with all Eferdingen assembled to meet us, and we shall eat the marriage-dinner at Maurice's at the Golden Lion."

Hantsch has made an absurd mistake with regard to this marriage, in stating that the bride was only twelve years old. Kästner and other biographers have been content to repeat the same assertion without any comment, notwithstanding its evident improbability. The origin of the blunder is to be found in Kepler's correspondence with Bernegger, to whom, speaking of his wife, he says "She has been educated for twelve years by the Lady of Stahrenberg." This is by no means a single instance of carelessness in Hantsch; Kästner has pointed out others of greater consequence. It was owing to this marriage, that Kepler took occasion to write his new method of gauging, for as he tells us in his own peculiar style "last November I brought home a new wife, and as the whole course of Danube was then covered with the produce of the Austrian vineyards, to be sold at a reasonable rate, I purchased a few casks, thinking it my duty as a good husband and a father of a family, to see that my household was well provided with drink." When the seller came to ascertain the quantity, Kepler objected to his method of gauging, for he allowed no difference, whatever might be the proportion of the bulging parts. The reflections to which this incident gave rise, terminated in the publication of the above-mentioned treatise, which claims a place among the earliest specimens of what is now called the modern analysis. In it he extended several properties of plane figures to segments of cones and cylinders, from the consideration that "these solids are incorporated circles," and, therefore, that those properties are true of the whole which belong to each component part. That the book might end as oddly as it began, Kepler concluded it with a parody of Catullus:

> "Et cum pocula mille mensi erimus
> Conturbabimus illa, ne sciamus."

His new residence at Linz was not long undisturbed. He quarrelled there, as he had done in the early part of his life at Gratz, with the Roman Catholic party, and was excommunicated. "Judge," says he to Peter Hoffman, "how far I can assist you, in a place where the priest and school-inspector have combined to brand me with the public stigma of heresy, because in every question I take that side which seems to me to be consonant with the word of God." The particular dogma which occasioned his excommunication, was connected with the doctrine of transubstantiation. He published his creed in a copy of Latin verses, preserved by his biographer Hantsch.

Before this occurrence, Kepler had been called to the diet at Ratisbon to give his opinion on the propriety of adopting the Gregorian reformation of the calendar, and he published a short essay, pointing out the respective convenience of doing so, or of altering the old Julian Calendar in some other manner. Notwithstanding the readiness of the diet to avail themselves of his talents for the settlement of a difficult question, the arrears of his salary were not paid much more regularly than they had been in Rodolph's time, and he was driven to provide himself with money by the publication of his almanac, of which necessity he heavily and justly complained. "In order to pay the expense of the Ephemeris for these two years, I have also written a vile prophesying almanac, which is scarcely more respectable than begging; unless it be because it saves the emperor's credit, who abandons me entirely; and with all his frequent and recent orders in council, would suffer me to perish with hunger." Kepler published this Ephemeris annually till 1620; ten years later he added those belonging to the years from 1620 to 1628.

In 1617 Kepler was invited into Italy, to succeed Magini as Professor of Mathematics at Bologna. The offer tempted him; but, after mature consideration, he rejected it, on grounds which he thus explained to Roffini:—"By birth and spirit I am a German, imbued with German principles, and bound by such family ties, that even if the emperor should consent, I could not, without the greatest difficulty, remove my dwelling-place from Germany into Italy. And although the glory of holding so distinguished a situation among the venerable professors of Bologna stimulates me, and there appears great likelihood of notably increasing my fortune, as well from the great concourse to the public lectures, as from private tuition; yet, on the other hand, that period of my life is past which was once excited by novelty, or which might promise itself a long enjoyment of these advantages. Besides, from a boy up to my present years, living a German among Germans, I am accustomed to a degree of freedom in my speech and manners, which, if persevered in on my removal to Bologna, seems likely to draw upon me, if not danger, at least notoriety, and might expose me to suspicion and party malice. Notwithstanding this answer, I have yet hopes that your most honourable invitation will be of service to me, and may make the imperial treasurer more ready than he has hitherto been to fulfil his master's intentions towards me. In that case I shall the sooner be able to publish the Rudolphine Tables and the Ephemerides, of which you had the scheme so many years back; and in this manner you and your advisers may have no reason to regret this invitation, though for the present it seems fruitless."

In 1619, the Emperor Matthias died, and was succeeded by Ferdinand III., who retained Kepler in the post he had filled under his two predecessors on the imperial throne. Kästner, in his "History of Mathematics," has corrected a gross error of Hantsch, in asserting that Kepler prognosticated Matthias's death. The letter to which Hantsch refers, in support of his statement, does indeed mention the emperor's death, but merely as a notorious event, for the purpose of recalling a date to the memory of his correspondent.

CHAPTER VII.

Kepler publishes his Harmonics—Account of his Astrological Opinions and Discovery of the Law of the Periods of the Planetary Revolutions—Sketch of Newton's proof of Kepler's Laws.

THE "Cosmographical Mystery" was written, as has been already mentioned, when Kepler was only twenty-six, and the wildness of its theories might be considered as due merely to the vivacity of a young man; but as if purposely to shew that his maturer age did not renounce the creations of his youthful fancy, he reprinted the "Mystery" in 1619, nearly at the same time when he published his celebrated work on Harmonics; and the extravagance of the latter publication does not at all lose in comparison with its predecessor. It is dedicated to James I. of England, and divided into five books: "The first, Geometrical, on the origin and demonstration of the laws of the figures which produce harmonious proportions;—the second, Architectonical, on figurate geometry, and the congruence of plane and solid regular figures;—the third, properly Harmonic, on the derivation of musical proportions from figures, and on the nature and distinction of things relating to song, in opposition to the old theories;—the fourth, Metaphysical, Psychological, and Astrological, on the mental essence of harmonies, and of their kinds in the world, especially on the harmony of rays emanating on the earth from the heavenly bodies, and on their effect in nature, and on the sublunary and human soul;—the fifth, Astronomical and Metaphysical, on the very exquisite harmonies of the celestial motions, and the origin of the excentricities in harmonious proportions."

The two first books are almost strictly, as Kepler styles them, geometrical, relating in great measure to the inscription of regular polygons in a circle. The following passage is curious, presenting an analogous idea to that contained in one of the extracts already given from the Commentaries on Mars. "The heptagon, and all other polygons and stars beyond it, which have a prime number of sides, and all other figures derived from them, cannot be inscribed geometrically in a circle; although their sides have a necessary magnitude, it is equally a matter of necessity that we remain ignorant of it. This is a question of great importance, for on this account is it that the heptagon, and other figures of this kind, have not been employed by God in the adornment of the world, as the other intelligible figures are employed which have been already explained." Kepler then introduces the algebraical equation, on the solution of which this problem depends, and makes a remark which is curious at this period of the history of algebra—that the root of an equation which cannot be accurately found, may yet be found within any degree of approximation by an expert calculator. In conclusion he again remarks that "the side of the heptagon has no place among scientific existences, since its formal description is impossible, and therefore it cannot be known by the human mind, since the possibility of description precedes the possibility of knowledge; nor is it known even by the simple eternal act of an omniscient mind, because its nature belongs to things which cannot be known. And yet this scientific nonentity has some scientific properties, for if a heptagon were described in a circle, the proportion of its sides would have analogous proportions."

The third book is a treatise on music, in the confined and ordinary sense in which we now use that word, and apparently a sober and rational one, at least as nearly so as Kepler could be trusted to write on a subject so dangerous to his discretion. All the extravagance of the work seems reserved for the fourth book, the title of which already conveys some notion of the nature of its contents. In this book he has collected the substance of the astrological opinions scattered through his other works. We shall content ourselves with merely citing his own words, without any attempt to explain the difference between the astrology which he believed, and that which he contemptuously rejected. The distinctive line seems very finely drawn, and as both one and the other are now discarded by all who enjoy the full use of their reasoning powers, it is not of much consequence that it should be accurately traced.

It is to be observed, that he does not in this treatise modify or recant anything of his earlier opinions, but refers to the favourable judgment of his contemporary philosophers as a reason for embodying them in a regular form. "Since many very celebrated professors of philosophy and medicine are of opinion that I have created a new and most true philosophy, this tender plant, like all novelties, ought to be carefully nursed and cherished, so that it may strike root in the minds of philosophers, and not be choked by the excessive humours of vain sophistications, or washed away by the torrents of vulgar prejudices, or frozen by the chill of public neglect; and if I succeed in guarding it from these dangers, I have no fear that it will be crushed by the storms of calumny, or parched by the sun of sterling criticism."

One thing is very remarkable in Kepler's creed, that he whose candour is so indisputable in every other part of his conduct, professed to have been forced to adopt his astrological opinions from direct and positive observation.—"It is now more than twenty years since I began to maintain opinions like these on the predominant nature of the elements, which, adopting the common name, I call sublunary. I have been driven to this not by studying or admiring Plato, but singly and solely by observing seasons, and noting the aspects by which they are produced. I have seen the state of the atmosphere almost uniformly disturbed as often as the planets are in conjunction, or in the other configurations so celebrated among astrologers. I have noticed its tranquil state, either when there are none or few such aspects, or when they are transitory and of short duration. I have not formed an opinion on this matter without good grounds, like the common herd of prophesiers, who describe the operations of the stars as if they were a sort of deities, the lords of heaven and earth, and producing everything at their pleasure. They never trouble themselves to consider what means the stars have of working any effects among us on the earth, whilst they remain in the sky, and send down nothing to us which is obvious to the senses except rays of light. This is the principal source of the filthy astrological superstitions of that vulgar and childish race of dreamers, the prognosticators."

The real manner in which the configurations of the stars operate, according to Kepler, is as follows:—"Like one who listens to a sweet melodious song, and by the gladness of his countenance, by his voice, and by the beating of his hand or foot attuned to the music, gives token that he perceives and approves the harmony: just so does sublunary nature, with the notable and evident emotion of the bowels of the earth, bear like witness to the same feelings, especially at those times when the rays of the planets form harmonious configurations on the earth."—"I have been confirmed in this theory by that which might have deterred others; I mean, by observing that the emotions do not agree nicely with the instants of the configurations; but the earth sometimes appears lazy and obstinate, and at another time (after important and long-continued configurations) she becomes exasperated, and gives way to her passion, even without the continuation of aspects. For in fact the earth is not an animal like a dog, ready at every nod; but more like a bull, or an elephant, slow to become angry, and so much the more furious when incensed."

This singular doctrine must not be mistaken for one of Kepler's favourite allegories; he actually and literally professed to believe that the earth was an enormous living animal; and he has enumerated, with a particularity of details into which we forbear to follow him, the analogies he recognized between its habits and those of men and other animals. A few samples of these may speak for the rest. "If any one who has climbed the peaks of the highest mountains throw a stone down their very deep clefts, a sound is heard from them; or if he throw it into one of the mountain lakes, which beyond doubt are bottomless, a storm will immediately arise, just as when you thrust a straw into the ear or nose of a ticklish animal, it shakes its head, or runs shuddering away. What so like breathing, especially of those fish who draw water into their mouths and spout it out again through their gills, as that wonderful tide! For although it is so regulated according to the course of the moon, that, in the preface to my 'Commentaries on Mars,' I have mentioned it as probable that the waters are attracted by the moon as iron is by the loadstone; yet, if any one uphold that the earth regulates its breathing according to the motion of the sun and moon, as animals have daily and nightly alternations of sleep and waking, I shall not think his philosophy unworthy of being listened to; especially if any flexible parts should be discovered in the depths of the earth to supply the functions of lungs or gills."

From the next extract, we must leave the reader to learn as well as he may, how much Kepler did, and how much he did not believe on the subject of genethliac astrology.—"Hence it is that human spirits, at the time of celestial aspects, are particularly urged to complete the matters which they have in hand. What the goad is to the ox, what the spur or the rowel is to the horse, to the soldier the bell and trumpet, an animated speech to an audience, to a crowd of rustics a performance on the fife and bagpipes, that to all, and especially in the aggregate, is a heavenly configuration of suitable planets; so that every single one is excited in his thoughts and actions, and all become more ready to unite and associate their efforts. For instance, in war you may see that tumults, battles, fights, invasions, assaults, attacks, and panic fears, generally happen at the time of the aspects of Mars and Mercury, Mars and Jupiter, Mars and the Sun, Mars and Saturn, &c. In epidemic diseases, a greater number of persons are attacked at the times of the powerful aspects, they suffer more severely, or even die, owing to the failure of nature in her strife with the disease, which strife (and not the death) is occasioned by the aspect. It is not the sky which does all these things immediately, but the faculty of the vital soul, associating its operation with the celestial harmonies, is the principal agent in this so-called influence of the heavens. Indeed this word influence has so fascinated some philosophers that they prefer raving with the senseless vulgar, to learning the truth with me. This essential property is the principal foundation of that admirable genethliac art. For when anything begins to have its being when that is working harmonies, the sensible harmony of the rays of the planets has peculiar influence on it. This then is the cause why those who are born under a season of many aspects among the planets, generally turn out busy and industrious, whether they accustom themselves from childhood to amass wealth, or are born or chosen to direct public affairs, or finally, have given their attention to study. If any one think that I might be taken as an instance of this last class, I do not grudge him the knowledge of my nativity. I am not checked by the reproach of boastfulness, notwithstanding those who, by speech or conduct, condemn as folly all kinds of writing on this subject; the idiots, the half-learned, the inventors of titles and trappings, to throw dust in the eyes of the people, and those whom Picus calls the plebeian theologians: among the true lovers of wisdom, I easily clear myself of this imputation, by the advantage of my reader; for there is no one whose nativity or whose internal disposition and temper I can learn so well as I know my own. Well then, Jupiter nearest the nonagesimal had passed by four degrees the trine of Saturn; the Sun and Venus, in conjunction, were moving from the latter towards the former, nearly in sextiles with both: they were also removing from quadratures with Mars, to which Mercury was closely approaching: the moon drew near the trine of the same planet, close to the Bull's Eye, even in latitude. The 25th degree of Gemini was rising, and the 22d of Aquarius culminating. That there was this triple configuration on that day—namely, the sextile of Saturn and the Sun, the sextile of Mars and Jupiter, the quadrature of Mercury and Mars, is proved by the change of weather; for, after a frost of some days, that very day became warmer, there was a thaw and a fall of rain.*"

"I do not wish this single instance to be taken as a defence and proof of all the aphorisms of astrologers, nor do I attribute to the heavens the government of human affairs: what a vast interval still separates these philosophical observations from that folly or madness as it should rather be called. For, following up this example, I knew a lady†, born under nearly the same aspects, whose disposition, indeed, was exceedingly restless, but who not only makes no progress in literature (that is not strange in a woman), but troubles her whole family, and is the cause to herself of deplorable misery. What, in my case, assisted the aspects was—firstly, the fancy of my mother when pregnant with me, a great admirer of her mother-in-law, my grandmother, who had some knowledge of medicine, my grandfather's profession; a second cause is, that I was born a male, and not a female, for astrologers have sought in vain to distinguish sexes in the sky; thirdly, I derive from my mother a habit of body, more fit for study than other kinds of life: fourthly, my parents' fortune was not large, and there was no landed property to which I might succeed and become attached; fifthly, there were the schools, and the liberality of the magistracy towards such boys as were apt for learning. But now if I am to speak of the result of my studies, what I pray can I find in the sky, even remotely alluding to it. The learned confess that several not despicable branches of philosophy have been newly extricated or amended or brought to perfection by me: but here my constellations were, not Mercury from the east, in the angle of the seventh, and in quadratures with Mars, but Copernicus, but Tycho Brahe, without whose books of observations everything now set by me in the clearest light must have remained buried in darkness; not Saturn predominating Mercury, but my Lords the Emperors Rodolph and Matthias; not Capricorn, the house of Saturn, but Upper Austria, the home of the Emperor, and the ready and unexampled bounty of his nobles to my petition. Here is that corner, not the western one of the horoscope, but on the Earth, whither, by permission of my imperial master, I have betaken myself from a too uneasy court; and whence, during these years of my life, which now tends towards its setting, emanate these Harmonies, and the other matters on which I am engaged."

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* This mode of verifying configurations, though something of the boldest, was by no means unusual. On a former occasion Kepler, wishing to cast the nativity of his friend Zehentmaier, and being unable to procure more accurate information than that he was born about three o'clock in the afternoon of the 21st of October, 1751, supplied the deficiency by a record of fevers and accidents at known periods of his life, from which he deduced a more exact horoscope.

† Kepler probably meant his own mother, whose horoscope he in many places declared to be nearly the same as his own.

"However, it may be owing to Jupiter's ascendancy that I take greater delight in the application of geometry to physics, than in that abstract pursuit which partakes of the dryness of Saturn; and it is perhaps the gibbous moon, in the bright constellation of the Bull's forehead, which fills my mind with fantastic images."

The most remarkable thing contained in the 5th Book, is the announcement of the celebrated law connecting the mean distances of the planets with the periods of their revolution about the Sun. This law is expressed in mathematical language, by saying that the squares of the times vary as the cubes of the distances*. Kepler's rapture on detecting it was unbounded, as may be seen from the exulting rhapsody with which he announced it. "What I prophecied two-and-twenty years ago, as soon as I discovered the five solids among the heavenly orbits — what I firmly believed long before I had seen Ptolemy's 'Harmonics'—what I had promised my friends in the title of this book, which I named before I was sure of my discovery—what, sixteen years ago, I urged as a thing to be sought—that for which I joined Tycho Brahe, for which I settled in Prague, for which I have devoted the best part of my life to astronomical contemplations, at length I have brought to light, and have recognized its truth beyond my most sanguine expectations. Great as is the absolute nature of Harmonics with all its details, as set forth in my third book, it is all found among the celestial motions, not indeed in the manner which I imagined, (that is not the least part of my delight,) but in another very different, and yet most perfect and excellent. It is now eighteen months since I got the first glimpse of light, three months since the dawn, very few days since the unveiled sun, most admirable to gaze on, burst out upon me. Nothing holds me; I will indulge in my sacred fury; I will triumph over mankind by the honest confession, that I have stolen the golden vases of the Egyptians*, to build up a tabernacle for my God far away from the confines of Egypt. If you forgive me, I rejoice; if you are angry, I can bear it: the die is cast, the book is written; to be read either now or by posterity, I care not which: it may well wait a century for a reader, as God has waited six thousand years for an observer."

He has told, with his usual particularity, the manner and precise moment of the discovery. "Another part of my 'Cosmographical Mystery,' suspended twenty-two years ago, because it was then undetermined, is completed and introduced here, after I had discovered the true intervals of the orbits, by means of Brahe's observations, and had spent the continuous toil of a long time in investigating the true proportion of the periodic times to the orbits,

> Sera quidem respexit inertem,
> Respexit tamen, et longo post tempore venit.

If you would know the precise moment, the first idea came across me on the 8th March of this year, 1618; but chancing to make a mistake in the calculation, I rejected it as false. I returned again to it with new force on the 15th May, and it has dissipated the darkness of my mind by such an agreement between this idea and my seventeen years' labour on Brahe's observations, that at first I thought I must be dreaming, and had taken my result for granted in my first assumptions. But the fact is perfect, the fact is certain, that the proportion existing between the periodic times of any two planets is exactly the sesquiplicate proportion of the mean distances of the orbits."

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* See Preliminary Treatise, p. 13.

* In allusion to the Harmonics of Ptolemy.

There is high authority for not attempting over anxiously to understand the rest of the work. Delambre sums it up as follows:—"In the music of the celestial bodies it appears that Saturn and Jupiter take the bass, Mars the tenor, the Earth and Venus the counter-tenor, and Mercury the treble." If the patience of this indefatigable historian gave way, as he confesses, in the perusal, any further notice of it here may be well excused. Kepler became engaged, in consequence of this publication, in an angry controversy with the eccentric Robert Fludd, who was at least Kepler's match in wild extravagance and mysticism, if far inferior to him in genius. It is diverting to hear each reproaching the other with obscurity.

In the "Epitome of the Copernican Astronomy," which Kepler published about the same time, we find the manner in which he endeavoured to deduce the beautiful law of periodic times, from his principles of motion and radiation of whirling forces. This work is in fact a summary of all his astronomical opinions, drawn up in a popular style in the form of question and answer. We find there a singular argument against believing, as some did, that each planet is carried round by an angel, for in that case, says Kepler, "the orbits would be perfectly circular; but the elliptic form, which we find in them, rather smacks of the nature of the lever and material necessity."

The investigation of the relation between the periodic times and distances of the planets is introduced by a query whether or not they are to be considered heavy. The answer is given in the following terms:—"Although none of the celestial globes are heavy, in the sense in which we say on earth that a stone is heavy, nor light as fire is light with us, yet have they, by reason of their materiality, a natural inability to move from place to place: they have a natural inertness or quietude, in consequence of which they remain still in every situation where they are placed alone."

"*P.* Is it then the sun, which by its turning carries round the planets? How can the sun do this, having no hands to seize the planet at so great a distance, and force it round along with itself?—Its bodily virtue, sent forth in straight lines into the whole space of the world, serves instead of hands; and this virtue, being a corporeal species, turns with the body of the sun like a very rapid vortex, and travels over the whole of that space which it fills as quickly as the sun revolves in its very confined space round the centre.

"*P.* Explain what this virtue is, and belonging to what class of things?—As there are two bodies, the mover and the moved, so are there two powers by which the motion is obtained. The one is passive, and rather belonging to matter, namely, the resemblance of the body of the planet to the body of the sun in its corporeal form, and so that part of the planetary body is friendly, the opposite part hostile to the sun. The other power is active, and bearing more relation to form, namely, the body of the sun has a power of attracting the planet by its friendly part, of repelling it by the hostile part, and finally, of retaining it if it be placed so that neither the one nor the other be turned directly towards the sun.

"*P.* How can it be that the whole body of the planet should be like or cognate to the body of the sun, and yet part of the planet friendly, part hostile to the sun?—Just as when one magnet attracts another, the bodies are cognate; but attraction takes place only on one side, repulsion on the other.

"*P.* Whence, then, arises that difference of opposite parts in the same body?—In magnets the diversity arises from the situation of the parts with respect to the whole. In the heavens the matter is a little differently arranged, for the sun does not, like the magnet, possess only on one side, but in all the parts of its substance, this active and energetic faculty of attracting, repelling, or retaining the planet. So that it is probable that the centre of the solar body corresponds to one extremity or pole of the magnet, and its whole surface to the other pole.

"*P.* If this were so, all the planets

would be restored* in the same time with the sun?—True, if this were all: but it has been said already that, besides this carrying power of the sun, there is also in the planets a natural inertness to motion, which causes that, by reason of their material substance, they are inclined to remain each in its place. The carrying power of the sun, and the impotence or material inertness of the planet, are thus in opposition. Each shares the victory; the sun moves the planet from its place, although in some degree it escapes from the chains with which it was held by the sun, and so is taken hold of successively by every part of this circular virtue, or, as it may be called, solar circumference, namely, by the parts which follow those from which it has just extricated itself.

"*P.* But how does one planet extricate itself more than another from this violence—First, because the virtue emanating from the sun has the same degree of weakness at different distances, as the distances or the width of the circles described on these distances†. This is the principal reason. Secondly, the cause is partly in the greater or less inertness or resistance of the planetary globes, which reduces the proportions to one-half; but of this more hereafter.

"*P.* How can it be that the virtue emanating from the sun becomes weaker at a greater distance? What is there to hurt or weaken it?—Because that virtue is corporeal, and partaking of quantity, which can be spread out and rarefied. Then, since there is as much virtue diffused in the vast orb of Saturn as is collected in the very narrow one of Mercury, it is very rare and therefore weak in Saturn's orbit, very dense and therefore powerful at Mercury.

"*P.* You said, in the beginning of this inquiry into motion, that the periodic times of the planets are exactly in the sesquiplicate proportion of their orbits or circles: pray what is the cause of this?—Four causes concur for lengthening the periodic time. First, the length of the path; secondly, the weight or quantity of matter to be carried; thirdly, the degree of strength of the moving virtue; fourthly, the bulk or space into which is spread out the matter to be moved. The circular paths of the planets are in the simple ratio of the distances; the weights or quantities of matter in different planets are in the subduplicate ratio of the same distances, as has been already proved; so that with every increase of distance, a planet has more matter, and therefore is moved more slowly, and accumulates more time in its revolution, requiring already as it did more time by reason of the length of the way. The third and fourth causes compensate each other in a comparison of different planets: the simple and subduplicate proportion compound the sesquiplicate proportion, which therefore is the ratio of the periodic times."

Three of the four suppositions here made by Kepler to explain the beautiful law he had detected, are now indisputably known to be false. Neither the weights nor the sizes of the different planets observe the proportions assigned by him, nor is the force by which they are retained in their orbits in any respect similar in its effects to those attributed by him to it. The wonder which might naturally be felt that he should nevertheless reach the desired conclusion, will be considerably abated on examining the mode in which he arrived at and satisfied himself of the truth of these three suppositions. It has been already mentioned that his notions on the existence of a whirling force emanating from the sun, and decreasing in energy at increased distances, are altogether inconsistent with all the experiments and observations we are able to collect. His reason for asserting that the sizes of the different planets are proportional to their distances from the sun, was simply because he chose to take for granted that either their solidities, surfaces, or diameters, must necessarily be in that proportion, and of the three, the solidities appeared to him least liable to objection. The last element of his precarious reasoning rested upon equally groundless assumptions. Taking as a principle, that where there is a number of different things they must be different in every respect, he declared that it was quite unreasonable to suppose all the planets of the same density. He thought it indisputable that they must be rarer as they were farther from the sun, "and yet not in the proportion of their distances, for thus we should sin against the law of variety in another way, and make the quantity of matter (according to what he had just said of their bulk) the same in all. But if we assume the ratio of the quantities of matter to be half that of the distances, we shall observe the best mean of all; for thus Saturn will be half as heavy again as Jupiter, and Jupiter half again as dense as Saturn. And the strongest argument of all is, that unless we assume this proportion of the densities, the law of the periodic times will not answer." This is the *proof* alluded to, and it is clear that by such reasoning any required result might be deduced from any given principles.

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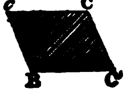
* This is a word borrowed from the Ptolemaic astronomy, according to which the sun and planets are hurried from their places by the daily motion of the *primum mobile*, and by their own peculiar motion seek to regain or be restored to their former places.

† In other parts of his works Kepler assumes the diminution to be proportional to the circles themselves, not to the diameters.

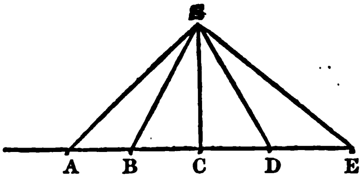
It may not be uninstructive to subjoin a sketch of the manner in which Newton established the same celebrated results, starting from principles of motion diametrically opposed to Kepler's, and it need scarcely be added, reasoning upon them in a manner not less different. For this purpose, a very few prefatory remarks will be found sufficient.

The different motions seen in nature are best analysed and classified by supposing that every body in motion, if left to itself, will continue to move forward at the same rate in a straight line, and by considering all the observed deviations from this manner of moving, as exceptions and disturbances occasioned by some external cause. To this supposed cause is generally given the name of Force, and it is said to be the first law of motion, that, unless acted on by some force, every body at rest remains at rest, and every body in motion proceeds uniformly in a straight line. Many employ this language, without perceiving that it involves a definition of force, on the admission of which, it is reduced to a truism. We see common instances of force in a blow, or a pull from the end of a string fastened to the body: we shall also have occasion presently to mention some forces where no visible connexion exists between the moving body and that towards which the motion takes place, and from which the force is said to proceed.

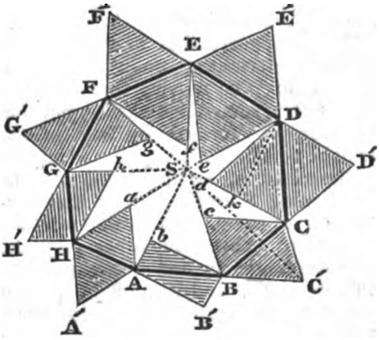
A second law of motion, founded upon experiment, is this: if a body have motion communicated to it in two directions, by one of which motions alone it would have passed through a given space in a given time, as for instance, through B C′ in one second, and by the other alone through any other space B *c* in the same time, it will, when both are given to it at the same instant, pass in the same time (in the present instance in one second) through B C the diagonal of the parallelogram of which B C′ and B *c* are sides.



Let a body, acted upon by no force, be moving along the line A E; that means, according to what has been said, let it pass over the equal straight lines A B, B C, C D, D E, &c., in equal times. If we take any point S not in the line A E, and join A S, B S, &c., the triangles A S B, B S C, &c. are also equal, having a common altitude and standing on equal bases, so that if a string were conceived reaching from S to the moving body (being lengthened or shortened in each position to suit its distance from S), this string, as the body moved along A E, would sweep over equal triangular areas in equal times.



Let us now examine how far these conclusions will be altered if the body from time to time is forced towards S. We will suppose it moving uniformly from A to B as before, no matter for the present how it got to A, or into the direction A B. If left to itself it would, in an equal time (say 1″) go through B C′ in the same straight line with and equal to A B. But just as it reaches B, and is beginning to move along B C′, let it be suddenly pulled towards S with a motion which, had it been at rest, would have carried it in the same time, 1″, through any other space B *c*. According to the second law of motion, its direction during this 1″, in consequence of the two motions combined, will be along B C, the diagonal of the parallelogram of which B C′, B *c*, are sides. In



this case, as this figure is drawn, B C, though passed in the same time, is longer than A B; that is to say, the body is moving quicker than at first. How is it with the triangular areas, supposed as before to be swept by a string constantly stretched between S and the body? It will soon be seen that these still remain equal, notwithstanding the change of direction, and increased swiftness. For since C C′ is parallel to B *c*, the triangles S C B, S C′ B are equal, being on the same base S B, and between the same parallels S B, C C′, and S C′B is equal to S B A as before, therefore S C B, S B A are equal. The body is now moving uniformly (though quicker than along A B) along B C. As before, it would in a time equal to the time of passing along B C, go through an equal space C D′ in the same straight line. But if at C it has a second pull towards S, strong enough to carry it to *d* in the same time, its direction will change a second time to C D, the diagonal of the parallelogram, whose sides are C D′, C *d*; and the circumstances being exactly similar to those at the first pull, it is shewn in the same manner that the triangular area S D C = S C B = S B A.

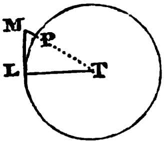
Thus it appears, that in consequence of these intermitting pulls towards S, the body may be moving round, sometimes faster, sometimes slower, but that the triangles formed by any of the straight portions of its path (which are all described in equal times), and the lines joining S to the ends of that portion, are all equal. The path it will take depends of course, in other respects, upon the frequency and strength of the different pulls, and it might happen, if they were duly proportionate, that when at H, and moving off in the direction H A′, the pull H *a* might be such as just to carry the body back to A, the point from which it started, and with such a motion, that after one pull more, A *b*, at A, it might move along A B as it did at first. If this were so, the body would continue to move round in the same polygonal path, alternately approaching and receding from S, as long as the same pulls were repeated in the same order, and at the same intervals.

It seems almost unnecessary to remark, that the same equality which subsists between any two of these triangular areas subsists also between an equal number of them, from whatever part of the path taken; so that, for instance, the four paths A B, B C, C D, D E, corresponding to the four areas A S B, B S C, C S D, D S E, that is, to the area A B C D E S, are passed in the same time as the four E F, F G, G H, H A, corresponding to the equal area E F G H A S. Hence it may be seen, if the whole time of revolution from A round to A again be called a year, that in half a year the body will have got to E, which in the present figure is more than half way round, and so of any other periods.

The more frequently the pulls are supposed to recur, the more frequently will the body change its direction; and if the pull were supposed constantly exerted in the direction towards S, the body would move in a curve round S, for no three successive positions of it could be in a straight line. Those who are not familiar with the methods of measuring curvilinear spaces must here be contented to observe, that the law holds, however close the pulls are brought together, and however closely the polygon is consequently made to resemble a curve: they may, if they please, consider the minute portions into which the curve is so divided, as differing insensibly from little rectilinear triangles, any equal number of which, according to what has been said above, wherever taken in the curve, would be swept in equal times. The theorem admits, in this case also, a rigorous proof; but it is not easy to make it entirely satisfactory, without entering into explanations which would detain us too long from our principal subject.

The proportion in which the pull is strong or weak at different distances from the central spot, is called "*the law of the central or centripetal force*," and it may be observed, that after assuming the laws of motion, our investigations cease to have anything hypothetical or experimental in them; and that if we wish, according to these principles of motion, to determine the law of force necessary to make a body move in a curve of any required form, or conversely to discover the form of the curve described, in consequence of any assumed law of force, the inquiry is purely geometrical, depending upon the nature and properties of geometrical quantities only. This distinction between what is hypothetical, and what necessary truth, ought never to be lost sight of.

As the object of the present treatise is not to teach geometry, we shall describe, in very general terms, the manner in which Newton, who was the first who systematically extended the laws of motion to the heavenly bodies, identified their results with the two remaining laws of Kepler. His "Principles of Natural Philosophy" contain general propositions with regard to any law of centripetal force, but that which he supposed to be the true one in our system, is expressed in mathematical language, by saying that the centripetal force varies inversely as the square of the distance, which means, that if the force at any distance be taken for the unit of force, at half that distance, it is two times twice, or four times as strong; at one-third the distance, three times thrice, or nine times as strong, and so for other distances. He shewed the probability of this law in the first instance by comparing the motion of the moon with that of heavy bodies at the surface of the earth. Taking L P to represent part of the moon's orbit described in one minute, the line P M between the orbit and the tangent at L would shew the space through which the central force at the earth (assuming the above principles of motion to be correct) would draw the moon. From the known distance and motion of the moon, this line P M is found to be about sixteen feet. The distance of the moon is about sixty times the radius of the earth, and therefore if the law of the central force in this instance were such as has been supposed, the force at the earth's surface would be 60 times 60, or 3600 times stronger, and at the earth's surface, the central force would make a body fall through 3600 times 16 feet in one minute. Galileo had already taught that the spaces through which a body would be made to fall, by the constant action of the same unvarying force, would be proportional to the squares of the times during which the force was exerted, and therefore according to these laws, a body at the earth's surface ought (since there are sixty seconds in a minute) to fall through 16 feet in one second, which was precisely the space previously established by numerous experiments.



With this confirmation of the supposition, Newton proceeded to the purely geometrical calculation of the law of centripetal* force necessary to make a moving body describe an ellipse round its focus, which Kepler's observations had established to be the form of the orbits of the planets round the sun. The result of the inquiry shewed that this curve required the same law of the force, varying inversely as the square of the distance, which therefore of course received additional confirmation. His method of doing this may, perhaps, be understood by referring to the last figure but one, in which C d, for instance, representing the space fallen from any point C towards S, in a given time, and the area C S D being proportional to the corresponding time, the space through which the body would have fallen at C in any other time (which would be greater, by Galileo's law, in proportion to the squares of the times), might be represented by a quantity varying directly as C d, and inversely in the duplicate proportion of the triangular area C S D, that is to say, proportional to $\frac{C\,d}{(S\,C \times D\,k)^2}$, if D k be drawn from D perpendicular on S C. If this polygon represent an ellipse, so that C D represents a small arc of the curve, of which S is the focus, it is found by the nature of that curve, that $\frac{C\,d}{(D\,k)^2}$ is the same at all points of the curve, so that the law of variation of the force in the same ellipse is represented solely by $\frac{1}{(S\,C)^2}$. If C d, &c. are drawn so that $\frac{C\,d}{(D\,k)^2}$ is not the same at every point, the curve ceases to be an ellipse whose focus is at S, as Newton has shewn in the same work. The line to which $\frac{(D\,k)^2}{C\,d}$ is found to be equal, is one drawn through the focus at right angles to the longest axis of the ellipse till it meets the curve;—this line is called the *latus rectum*, and is a third proportional to the two principal axes.

Kepler's third law follows as an immediate consequence of this determination; for, according to what has been already shown, the time of revolution round the whole ellipse, or, as it is commonly called, the periodic time, bears the same ratio to the unit of time as the whole area of the ellipse does to the area described in that unit. The area of the whole ellipse is proportional in different ellipses to the rectangle contained by the two principal axes, and the area described in an unit of time is proportional to $S C \times D k$, that is to say, is in the subduplicate ratio of $S C^2 \times D k^2$, or $\frac{D k^2}{C d}$, when the force varies inversely as the square of the distance $S C$; and in the ellipse, as we have said already, this is equal to a third proportional to the principal axes; consequently the periodic times in different ellipses, which are proportional to the whole areas of the ellipses directly, and the areas described in the unit of time inversely, are in the compound ratio of the rectangle of the axes directly, and subduplicatly as a third proportional to the axes inversely; that is to say, the squares of these times are proportional to the cubes of the longest axes, which is Kepler's law.

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* In many curves, as in the circle and ellipse, there is a point to which the name of centre is given, on account of peculiar properties belonging to it: but the term "centripetal force" always refers to the place towards which the force is directed, whether or not situated in the centre of the curve.

CHAPTER VIII.

The Epitome prohibited at Rome—Logarithmic Tables—Trial of Catharine Kepler—Kepler invited to England—Rudolphine Tables—Death—Conclusion.

KEPLER'S "Epitome," almost immediately on its appearance, enjoyed the honour of being placed by the side of the work of Copernicus, on the list of books prohibited by the congregation of the Index at Rome. He was considerably alarmed on receiving this intelligence, anticipating that it might occasion difficulties in publishing his future writings. His words to Remus, who had communicated the news to him, are as follows:—"I learn from your letter, for the first time, that my book is prohibited at Rome and Florence. I particularly beg of you, to send me the exact words of the censure, and that you will inform me whether that censure would be a snare for the author, if he were caught in Italy, or whether, if taken, he would be enjoined a recantation. It is also of consequence for me to know whether there is any chance of the same censure being extended into Austria. For if this be so, not only shall I never again find a printer there, but also the copies which the bookseller has left in Austria at my desire will be endangered, and the ultimate loss will fall upon me. It will amount to giving me to understand, that I must cease to profess Astronomy, after I have grown old in the belief of these opinions, having been hitherto gainsayed by no one,—and, in short, I must give up Austria itself, if room is no longer to be left in it for philosophical liberty." He was, however, tranquillized, in a great degree, by the reply of his friend, who told him that "the book is only prohibited as contrary to the decree pronounced by the holy office two years ago. This has been partly occasioned by a Neapolitan monk (Foscarini), who was spreading these notions by publishing them in Italian, whence were arising dangerous consequences and opinions: and besides, Galileo was at the same time pleading his cause at Rome with too much violence. Copernicus has been corrected in the same manner for some lines, at least in the beginning of his first book. But by obtaining a permission, they may be read (and, as I suppose, this "Epitome" also) by the learned and skilful in this science, both at Rome and throughout all Italy. There is therefore no ground for your alarm, either in Italy or Austria; only keep yourself within bounds, and put a guard upon your own passions."

We shall not dwell upon Kepler's different works on comets, beyond mentioning that they were divided, on the plan of many of his other publications, into three parts, Astronomical, Physical, and Astrological. He maintained that comets move in straight lines, with a varying degree of velocity. Later theories have shewn that they obey the same laws of motion as the planets, differing from them only in the extreme excentricity of their orbits. In the second book, which contains the Physiology of Comets, there is a passing remark that comets come out from the remotest parts of ether, as whales and monsters from the depth of the sea; and the suggestion is thrown out that perhaps comets are something of the nature of silkworms, and are wasted and consumed in spinning their own tails.

Among his other laborious employments, Kepler yet found time to calculate tables of logarithms, he having been one of the first in Germany to appreciate the full importance of the facilities they afford to the numerical calculator. In 1618 he wrote to his friend Schickhard: "There is a Scottish Baron (whose name has escaped my memory), who has made a famous contrivance, by which all need of multiplication and division is supplied by mere addition and subtraction; and he does it without sines. But even he wants a table of tangents *, and the variety, frequency, and difficulty of the additions and subtractions, in some cases, is greater than the labour of multiplying and dividing."

Kepler dedicated his "Ephemeris" for 1620 to the author of this celebrated invention, Baron Napier, of Merchistoun; and in 1624, published what he called "Chilias Logarithmorum," containing the Napierian logarithms of the quotients of 100,000 divided by the first ten numbers, then proceeding by the quotients of every ten to 100, and by hundreds to 100,000. In the supplement published the following year, is a curious notice of the manner in which this subtle contrivance was at first received: "In the year 1621, when I had gone into Upper Austria, and had conferred everywhere with those skilled in mathematics, on the subject of Napier's logarithms, I found that those whose prudence had increased, and whose readiness had diminished, through age, were hesitating whether to adopt this new sort of numbers, instead of a table of sines; because they said it was disgraceful to a professor of mathematics to exult like a child at some compendious method of working, and meanwhile to admit a form of calculation, resting on no legitimate proof, and which at some time might entangle us in error, when we least feared it. They complained that Napier's demonstration rested on a fiction of geometrical motion, too loose and slippery for a sound method of reasonable demonstration to be founded on it†. "This led me forthwith to conceive the germ of a legitimate demonstration, which during that same winter I attempted, without reference to lines or motion, or flow, or any other which I may call sensible quality."

"Now to answer the question; what is the use of logarithms? Exactly what ten years ago was announced by their author, Napier, and which may be told in these words.—Wheresoever in common arithmetic, and in the Rule of Three, come two numbers to be multiplied together, there the sum of the logarithms is to be taken; where one number is to be divided by another, the difference; and the number corresponding to this sum or difference, as the case may be, will be the required product or quotient. This, I say, is the use of logarithms. But in the same work in which I gave the demonstration of the principles, I could not satisfy the unfledged arithmetical chickens, greedy of facilities, and gaping with their beaks wide open, at the mention of this use, as if to bolt down every particular gobbet, till they are crammed with my precepticles."

The year 1622 was marked by the catastrophe of a singular adventure which befell Kepler's mother, Catharine, then nearly seventy years old, and by which he had been greatly harassed and annoyed during several years. From her youth she had been noted for a rude and passionate temper, which on the present occasion involved her in serious difficulties. One of her female acquaintance, whose manner of life had been by no means unblemished, was attacked after a miscarriage by violent headaches, and Catharine, who had often taken occasion to sneer at her notorious reputation, was accused with having produced these consequences, by the administration of poisonous potions. She repelled the charge with violence, and instituted an action of scandal against this person, but was unlucky (according to Kepler's statement) in the choice of a young doctor, whom she employed as her advocate. Considering the suit to be very instructive, he delayed its termination during five years, until the judge before whom it was tried was displaced. He was succeeded by another, already indisposed against Catharine Kepler, who on some occasion had taunted him with his sudden accession to wealth from a very inferior situation. Her opponent, aware of this advantage, turned the ta-

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* The meaning of this passage is not very clear: Kepler evidently had seen and used logarithms at the time of writing this letter; yet there is nothing in the method to justify this expression,—"*At tamen opus est ipsi Tangentium canone.*"

† This was the objection originally made to Newton's "Fluxions," and in fact, Napier's idea of logarithms is identical with that method of conceiving quantities. This may be seen at once from a few of his definitions,

1 Def. A line is said to increase uniformly, when the point by which it is described passes through equal intervals, in equal times.

2 Def. A line is said to diminish to a shorter one proportionally, when the point passing along it cuts off in equal times segments proportional to the remainder.

6 Def. The logarithm of any sine is the number most nearly denoting the line, which has increased uniformly, whilst the radius has diminished to that sine proportionally, the initial velocity being the same in both motions. (Mirifici logarithmorum canonis descriptio, Edinburgi 1614.)

This last definition contains what we should now call the differential equation between a number and the logarithm of its reciprocal.

bles on her, and in her turn became the accuser. The end of the matter was, that in July, 1620, Catharine was imprisoned, and condemned to the torture. Kepler was then at Linz, but as soon as he learned his mother's danger, hurried to the scene of trial. He found the charges against her supported only by evidence which never could have been listened to, if her own intemperate conduct had not given advantage to her adversaries. He arrived in time to save her from the question, but she was not finally acquitted and released from prison till November in the following year. Kepler then returned to Linz, leaving behind him his mother, whose spirit seemed in no degree broken by the unexpected turn in the course of her litigation. She immediately commenced a new action for costs and damages against the same antagonist, but this was stopped by her death, in April 1622, in her seventy-fifth year.

In 1620 Kepler was visited by Sir Henry Wotton, the English ambassador at Venice, who finding him, as indeed he might have been found at every period of his life, oppressed by pecuniary difficulties, urged him to go over to England, where he assured him of a welcome and honourable reception; but Kepler could not resolve upon the proposed journey, although in his letters he often returned to the consideration of it. In one of them, dated a year later, he says, "The fires of civil war are raging in Germany—they who are opposed to the honour of the empire are getting the upper hand—everything in my neighbourhood seems abandoned to flame and destruction. Shall I then cross the sea, whither Wotton invites me? I, a German? a lover of firm land? who dread the confinement of an island? who presage its dangers, and must drag along with me my little wife and flock of children? Besides my son Louis, now thirteen years old, I have a marriageable daughter, a two-year old son by my second marriage, an infant daughter, and its mother but just recovering from her confinement." Six years later, he says again,—"As soon as the Rudolphine Tables are published, my desire will be to find a place where I can lecture on them to a considerable assembly; if possible, in Germany; if not, why then in Italy, France, the Netherlands, or England, provided the salary is adequate for a traveller."

In the same year in which he received this invitation an affront was put upon Kepler by his early patrons, the States of Styria, who ordered all the copies of his "Calendar," for 1624, to be publicly burnt. Kepler declares that the reason of this was, that he had given precedence in the title-page to the States of Upper Ens, in whose service he then was, above Styria. As this happened during his absence in Wirtemberg, it was immediately coupled by rumour with his hasty departure from Linz: it was said that he had incurred the Emperor's displeasure, and that a large sum was set upon his head. At this period Matthias had been succeeded by Ferdinand III., who still continued to Kepler his barren title of imperial mathematician.

In 1624 Kepler went to Vienna, in the hopes of getting money to complete the Rudolphine Tables, but was obliged to be satisfied with the sum of 6000 florins and with recommendatory letters to the States of Suabia, from whom he also collected some money due to the emperor. On his return he revisited the University of Tubingen, where he found his old preceptor, Mästlin, still alive, but almost worn out with old age. Mästlin had well deserved the regard Kepler always appears to have entertained for him; he had treated him with great liberality whilst at the University, where he refused to receive any remuneration for his instruction. Kepler took every opportunity of shewing his gratitude; even whilst he was struggling with poverty he contrived to send his old master a handsome silver cup, in acknowledging the receipt of which Mästlin says,—"Your mother had taken it into her head that you owed me two hundred florins, and had brought fifteen florins and a chandelier towards reducing the debt, which I advised her to send to you. I asked her to stay to dinner, which she refused: however, we handselled your cup, as you know she is of a thirsty temperament."

The publication of the Rudolphine Tables, which Kepler always had so much at heart, was again delayed, notwithstanding the recent grant, by the disturbances arising out of the two parties into which the Reformation had divided the whole of Germany. Kepler's library was sealed up by desire of the Jesuits, and nothing but his connexion with the Imperial Court secured to him his own personal indemnity. Then followed a popular insurrection, and the peasantry blockaded Linz, so that it was not until 1627 that these celebrated tables finally made their appearance, the earliest calculated on the supposition that the planets move in elliptic orbits. Ptolemy's tables had been succeeded by the "Alphonsine," so called from Alphonso, King of Castile, who, in the thirteenth century, was an enlightened patron of astronomy. After the discoveries of Copernicus, these again made way for the Prussian, or Prutenic tables, calculated by his pupils Reinhold and Rheticus. These remained in use till the observations of Tycho Brahe showed their insufficiency, and Kepler's new theories enabled him to improve upon them. The necessary types for these tables were cast at Kepler's own expense. They are divided into four parts, the first and third containing a variety of logarithmic and other tables, for the purpose of facilitating astronomical calculations. In the second are tables of the elements of the sun, moon, and planets. The fourth gives the places of 1000 stars as determined by Tycho, and also at the end his table of refractions, which appears to have been different for the sun, moon, and stars. Tycho Brahe assumed the horizontal refraction of the sun to be 7′ 30″, of the moon 8′, and of the other stars 3′. He considered all refraction of the atmosphere to be insensible above 45° of altitude, and even at half that altitude in the case of the fixed stars. A more detailed account of these tables is here obviously unsuitable: it will be sufficient to say merely, that if Kepler had done nothing in the course of his whole life but construct these, he would have well earned the title of a most useful and indefatigable calculator.

Some copies of these tables have prefixed to them a very remarkable map, divided by hour lines, the object of which is thus explained:—

"The use of this nautical map is, that if at a given hour the place of the moon is known by its edge being observed to touch any known star, or the edges of the sun, or the shadow of the earth; and if that place shall (if necessary) be reduced from apparent to real by clearing it of parallax; and if the hour at Uraniburg be computed by the Rudolphine tables, when the moon occupied that true place, the difference will show the observer's meridian, whether the picture of the shores be accurate or not, for by this means it may come to be corrected."

This is probably one of the earliest announcements of the method of determining longitudes by occultations; the imperfect theory of the moon long remained a principal obstacle to its introduction in practice. Another interesting passage connected with the same object may be introduced here. In a letter to his friend Cruger, dated in 1616, Kepler says: "You propose a method of observing the distances of places by sundials and automata. It is good, but needs a very accurate practice, and confidence in those who have the care of the clocks. Let there be only one clock, and let it be transported; and in both places let meridian lines be drawn with which the clock may be compared when brought. The only doubt remaining is, whether a greater error is likely from the unequal tension in the automaton, and from its motion, which varies with the state of the air, or from actually measuring the distances. For if we trust the latter, we can easily determine the longitudes by observing the differences of the height of the pole."

In an Appendix to the Rudolphine Tables, or, as Kepler calls it, "an alms doled out to the nativity casters," he has shown how they may use his tables for their astrological predictions. Everything in his hands became an allegory; and on this occasion he says,—"Astronomy is the daughter of Astrology, and this modern Astrology, again, is the daughter of Astronomy, bearing something of the lineaments of her grandmother; and, as I have already said, this foolish daughter, Astrology, supports her wise but needy mother, Astronomy, from the profits of a profession not generally considered creditable."

Soon after the publication of these tables, the Grand Duke of Tuscany sent him a golden chain; and if we remember the high credit in which Galileo stood at this time in Florence, it does not seem too much to attribute this honourable mark of approbation to his representation of the value of Kepler's services to astronomy. This was soon followed by a new and final change in his fortunes. He received permission from the emperor to attach himself to the celebrated Duke of Friedland, Albert Wallenstein, one of the most remarkable men in the history of that time.

Wallenstein was a firm believer in astrology, and the reception Kepler experienced by him was probably due, in great measure, to his reputation in that art. However that may be, Kepler found in him a more munificent patron than any one of his three emperors; but he was not destined long to enjoy the appearance of better fortune. Almost the last work which he published was a commentary on the letter addressed, by the missionary Terrentio, from China, to the Jesuits at Ingolstadt. The object of this communication was to obtain from Europe means for carrying into effect a projected scheme for improving the Chinese calendar. In this essay Kepler maintains the opinion, which has been discussed with so much warmth in more modern times, that the pretended ancient observations of the Chinese were obtained by computing them backwards from a much more recent date. Wallenstein furnished him with an assistant for his calculations, and with a printing press; and through his influence nominated him to the professorship in the University of Rostoch, in the Duchy of Mecklenburg. His claims on the imperial treasury, which amounted at this time to 8000 crowns, and which Ferdinand would gladly have transferred to the charge of Wallenstein, still remained unsatisfied. Kepler made a last attempt to obtain them at Ratisbon, where the imperial meeting was held, but without success. The fatigue and vexation occasioned by his fruitless journey brought on a fever, which unexpectedly put an end to his life, in the early part of November, 1630, in his fifty-ninth year. His old master, Mästlin, survived him for about a year, dying at the age of eighty-one.

Kepler left behind him two children by his first wife, Susanna and Louis; and three sons and two daughters, Sebald, Cordelia, Friedman, Hildebert, and Anna Maria, by his widow. Susanna married, a few months before her father's death, a physician named Jacob Bartsch, the same who latterly assisted Kepler in preparing his "Ephemeris." He died very shortly after Kepler himself. Louis studied medicine, and died in 1663, whilst practising as a physician at Konigsberg. The other children died young.

Upon Kepler's death the Duke of Friedland caused an inventory to be taken of his effects, when it appeared that near 24,000 florins were due to him, chiefly on account of his salary from the emperor. His daughter Susanna, Bartsch's widow, managed to obtain a part of these arrears by refusing to give up Tycho Brahe's observations till her claims were satisfied. The widow and younger children were left in very straightened circumstances, which induced Louis, Kepler's eldest son, to print, for their relief, one of his father's works, which had been left by him unpublished. It was not without much reluctance, in consequence of a superstitious feeling which he did not attempt to conceal or deny. Kepler himself, and his son-in-law, Bartsch, had been employed in preparing it for publication at the time of their respective deaths; and Louis confessed that he did not approach the task without apprehension that he was incurring some risk of a similar fate. This little rhapsody is entitled a "Dream on Lunar Astronomy;" and was inintended to illustrate the appearances which would present themselves to an astronomer living upon the moon.

The narrative in the dream is put into the mouth of a personage, named Duracoto, the son of an Icelandic enchantress, of the name of Fiolxhildis. Kepler tells us that he chose the last name from an old map of Europe in his house, in which Iceland was called Fiolx: Duracoto seemed to him analogous to the names he found in the history of Scotland, the neighbouring country. Fiolxhildis was in the habit of selling winds to mariners, and used to collect herbs to use in her incantations on the sides of Mount Hecla, on the Eve of St. John. Duracoto cut open one of his mother's bags, in punishment of which she sold him to some traders, who brought him to Denmark, where he became acquainted with Tycho Brahe. On his return to Iceland, Fiolxhildis received him kindly, and was delighted with the progress he had made in astronomy. She then informed him of the existence of certain spirits, or demons, from whom, although no traveller herself, she acquired a knowledge of other countries, and especially of a very remarkable country, called Livania. Duracoto requesting further information, the necessary ceremonies were performed for invoking the demon; Duracoto and his mother enveloped their heads in their clothing, and presently "the screaking of a harsh dissonant voice began to speak in the Icelandic tongue." The island of Livania is situated in the depths of ether, at the distance of about 250000 miles; the road thence or thither is very seldom open, and even when it is passable, mankind find the journey a most difficult and dangerous one. The demon describes the method employed by his fellow spirits to convey such travellers as are thought fit for the undertaking: "We bring no sedentary people into our company, no corpulent or delicate persons; but we pick out those who waste their life in the continual use of post-horses, or who sail frequently to the Indies; who are accustomed to live upon biscuit, garlic, dried fish, and such abominable feeding. Those withered old hags are exactly fit for us, of whom the story is familiar that they travel immense distances by night on goats, and forks, and old petticoats. The Germans do not suit us at all; but we do not reject the dry Spaniards." This extract will probably be sufficient to show the style of the work. The inhabitants of Livania are represented to be divided into two classes, the Privolvans and Subvolvans, by whom are meant those supposed to live in the hemisphere facing the earth, which is called the Volva, and those on the opposite half of the moon: but there is nothing very striking in the account given of the various phenomena as respects these two classes. In some notes which were added some time after the book was first written, are some odd insights into Kepler's method of composing. Fiolxhildis had been made to invoke the dæmon with twenty-one characters; Kepler declares, in a note, that he cannot remember why he fixed on this number, "except because that is the number of letters in *Astronomia Copernicana*, or because there are twenty-one combinations of the planets, two together, or because there are twenty-one different throws upon two dice." The dream is abruptly terminated by a storm, in which, says Kepler, "I suddenly waked; the Demon, Duracoto, and Fiolxhildis were gone, and instead of their covered heads, I found myself rolled up among the blankets."

Besides this trifle, Kepler left behind him a vast mass of unpublished writings, which came at last into the hands of his biographer, Hantsch. In 1714, Hantsch issued a prospectus for publishing them by subscription, in twenty-two folio volumes. The plan met no encouragement, and nothing was published but a single folio volume of letters to and from Kepler, which seem to have furnished the principal materials for the memoir prefixed to them. After various unavailing attempts to interest different learned bodies in their appearance, the manuscripts were purchased for the library at St. Petersburg, where Euler, Lexell, and Kraft, undertook to examine them, and select the most interesting parts for publication. The result of this examination does not appear.

Kepler's body was buried in St. Peter's churchyard at Ratisbon, and a simple inscription was placed on his tombstone. This appears to have been destroyed not long after, in the course of the wars which still desolated the country. In 1786, a proposal was made to erect a marble monument to his memory, but nothing was done. Kästner, on whose authority it is mentioned, says upon this, rather bitterly, that it matters little whether or not Germany, having almost refused him bread during his life, should, a century and a half after his death, offer him a stone.

Delambre mentions, in his History of Astronomy, that this design was resumed in 1803 by the Prince Bishop of Constance, and that a monument has been erected in the Botanical Garden at Ratisbon, near the place of his interment. It is built in the form of a temple, surmounted by a sphere; in the centre is placed a bust of Kepler, in Carrara marble. Delambre does not mention the original of the bust; but says it is not unlike the figure engraved in the frontispiece of the Rudolphine Tables. That frontispiece consists of a portico of ten pillars, supporting a cupola covered with astronomical emblems. Copernicus, Tycho Brahe, Ptolemy, Hipparchus, and other astronomers, are seen among them. In one of the compartments of the common pedestal is a plan of the observatory at Uraniburg; in another, a printing press; in a third is the figure of a man, meant for Kepler, seated at a table. He is identified by the titles of his works, which are round him; but the whole is so small as to convey very little idea of his figure or countenance. The only portrait known of Kepler was given by him to his assistant Gringallet, who presented it to Bernegger; and it was placed by the latter in the library at Strasburg. Hantsch had a copy taken for the purpose of engraving it, but died before it was completed. A portrait of Kepler is engraved in the seventh part of Boissard's Bibliotheca Chalcographica. It is not known whence this was taken, but it may, perhaps, be a copy of that which was engraved by desire of Bernegger in 1620. The likeness is said not to have been well preserved. "His heart and genius," says Kästner, "are faithfully depicted in his writings; and that may console us, if we cannot entirely trust his portrait." In the preceding pages, it has been endeavoured to select such passages from his writings as might throw the greatest light on his character, with a subordinate reference only to the importance of the subjects treated. In conclusion, it may be well to support the opinion which has been ventured on the real nature of his triumphs, and on the danger of attempting to follow his method in the pursuit of truth, by the judgment pronounced by Delambre, as well on his failures as on his success. "Considering these matters in another point of view, it is not impossible to convince ourselves that Kepler may have been always the same. Ardent, restless, burning to distinguish himself by his discoveries, he attempted everything; and having once obtained a glimpse of one, no labour was too hard for him in following or verifying it. All his attempts had not the same success, and, in fact, that was impossible. Those which have failed seem to us only fanciful; those which have been more fortunate appear sublime. When in search of that which really existed, he has sometimes found it; when he devoted himself to the pursuit of a chimera, he could not but fail; but even there he unfolded the same qualities, and that obstinate perseverance that must triumph over all difficulties but those which are insurmountable*."

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* Histoire de l'Astronomie Moderne, Paris, 1821.

List of Kepler's published Works.

Ein Calender	*Gratz*, 1594
Prodromus Dissertat. Cosmograph.	*Tubingæ*, 1596, 4to.
De fundamentis Astrologiæ	*Pragæ*, 1602, 4to.
Paralipomena ad Vitellionem	*Francofurti*, 1604, 4to.
Epistola de Solis deliquio	1605
De stellâ novâ	*Pragæ*, 1606, 4to.
Vom Kometen	*Halle*, 1608, 4to.
Antwort an Röslin	*Pragæ*, 1609, 4to.
Astronomia Nova	*Pragæ*, 1609, fol.
Tertius interveniens	*Frankfurt*, 1610, 4to.
Dissertatio cum Nuncio Sidereo	*Francofurti*, 1610, 4to.
Strena, seu De nive sexangulâ	*Frankfurt*, 1611, 4to.
Dioptrica	*Francofurti*, 1611, 4to.
Vom Geburts Jahre des Heylandes	*Strasburg*, 1613, 4to.
Respons. ad epist S. Calvisiii	*Francofurti*, 1614, 4to.
Eclogæ Chronicæ	*Frankfurt*, 1615, 4to.
Nova Stereometria	*Lincii*, 1615, 4to.
Ephemerides 1617—1620	*Lincii*, 1616, 4to.
Epitomes Astron. Copern. Libri i. ii. iii.	*Lentiis*, 1618, 8vo.
De Cometis	*Aug. Vindelic.* 1619, 4to.
Harmonice Mundi	*Lincii*, 1619, fol.
Kanones Pueriles	*Ulmæ*, 1620
Epitomes Astron. Copern. Liber iv.	*Lentiis*, 1622, 8vo.
Epitomes Astron. Copern. Libri v. vi. vii.	*Francofurti*, 1622, 8vo.
Discurs von der grossen Conjunction	*Linz.* 1623, 4to.
Chilias Logarithmorum	*Marpurgi*, 1624, fol.
Supplementum	*Lentiis*, 1625, 4to.
Hyperaspistes	*Francofurti*, 1625, 8vo.
Tabulæ Rudolphinæ	*Ulmæ*, 1627, fol.
Resp. ad epist. J. Bartschii	*Sagani*, 1629, 4to.
De anni 1631 phænomenis	*Lipsæ*, 1629, 4to.
Terrentii epistolium cum commentatiunculâ	*Sagani*, 1630, 4to.
Ephemerides	*Sagani*, 1630, 4to.
Somnium	*Francofurti*, 1634, 4to.
Tabulæ manuales	*Argentorati*, 1700, 12mo.

LIFE OF SIR ISAAC NEWTON.

The following life is substantially a translation from that in the "Biographie Universelle," by M. Biot, the very learned French mathematician and natural philosopher; and to the kindness of this distinguished individual we feel deeply indebted, for allowing us to present this number to our readers. Those alterations only have been made, which we considered might render the treatise more adapted for the objects which the Society has in view.

ISAAC NEWTON was born at Woolsthorpe, in Lincolnshire, on the 25th December, 1642 (O. S.) the year in which Galileo died. At his birth he was so small and weak that his life was despaired of. At the death of his father, which took place while he was yet an infant, the manor of Woolsthorpe, of which his family had been in possession several years, became his heritage. In a short time his mother married again; but this new alliance did not interfere with the performance of her duties towards her son. She sent him, at an early age, to the school of his native village, and afterwards, on attaining his twelfth year, to the neighbouring town of Grantham, that he might be instructed in the classics. Her intention, however, was not to make her son a mere scholar, but to give him those first principles of education which were considered necessary for every gentleman, and to render him able to manage his own estate. After a short period, therefore, she recalled him to Woolsthorpe, and began to employ him in domestic occupations. For these he soon showed himself neither fitted nor inclined. Already, during his residence at Grantham, Newton, though still a child, had made himself remarkable by a decided taste for various philosophical and mechanical inventions. He was boarded in the house of an apothecary, named Clarke, where, caring but little for the society of other children, he provided himself with a collection of saws, hammers, and other instruments, adapted to his size; these he employed with such skill and intelligence, that he was able to construct models of many kinds of machinery; he also made hour-glasses, acting by the descent of water, which marked the time with extraordinary accuracy. A new windmill, of peculiar construction, having been erected in the vicinity of Grantham, Newton manifested a strong desire to discover the secret of its mechanism; and he accordingly went so often to watch the workmen employed in erecting it, that he was at length able to construct a model, which also turned with the wind, and worked as well as the mill itself; but with this difference, that he had added a *mouse* in the interior, which he called the *miller*, because it directed the mill, and ate up the flour, as a real miller might do. A certain acquaintance with drawing was necessary in these operations; to this art, though without a master, he successfully applied himself. The walls of his closet were soon covered with designs of all sorts, either copied from others, or taken from nature. These mechanical pursuits, which already implied considerable powers of invention and observation, occupied his attention to such a degree, that for them he neglected his studies in language; and, unless excited by particular circumstances, he ordinarily allowed himself to be surpassed by children of very inferior mental capacity. Having however, on some occasion, been surpassed by one of his class fellows, he determined to prevent the recurrence of such a mortification, and very shortly succeeded in placing himself at the head of them all.

It was after Newton had for several years cherished and, in part, unfolded so marked a disposition of mind, that his mother, having taken him home, wished to employ him in the affairs of her farm and household. The reader may easily judge that he had little inclination for such pursuits. More than once he was sent by his mother on market-days to Grantham, to sell corn and other articles of farming produce, and desired to purchase the provisions required for the family; but as he was still very young, a confidential servant was sent with him to teach him how to market. On these occasions, however, Newton, immediately after riding into the town, allowed his attendant to perform the business for which he was sent, while he himself retired to the house of the apothecary where he had formerly lodged, and employed his time in reading some old book, till the hour of return arrived. At other times he did not even proceed so far as the town, but stopping on the road, occupied himself in study, under the shelter of a hedge, till the servant came back. With such ardent desire for mental improvement, we may easily conceive that his repugnance to rural occupations must have been extreme; as soon as he could escape from them, his happiness consisted in sitting under some tree, either reading, or modelling in wood, with his knife, various machines that he had seen. To this day is shewn, at Woolsthorpe, a sun-dial, constructed by him on the wall of the house in which he lived. It fronts the garden, and is at the height to which a child can reach. This irresistible passion, which urged young Newton to the study of science, at last overcame the obstacles which the habits or the prudence of his mother had thrown in his way. One of his uncles having one day found him under a hedge, with a book in his hand, entirely absorbed in meditation, took it from him, and discovered that he was working a mathematical problem. Struck with finding so serious and decided a disposition in so young a person, he urged Newton's mother no longer to thwart him, but to send him once more to pursue his studies at Grantham.[*]

There he remained till he reached his eighteenth year, when he removed to Cambridge, and was entered at Trinity-College, in 1660. Since the beginning of the seventeenth century, a taste for the cultivation of mathematical knowledge had shown itself among the members of that University. The elements of algebra and geometry generally formed a part of the system of education, and Newton had the good fortune to find Dr. Barrow, professor; a man who, in addition to the merit of being one of the greatest mathematicians of his age, joined that of being the kindest instructor as well as the most zealous protector of the young genius growing up under his care.

Newton, in order to prepare himself for the public lessons, privately read the text books in advance, the better to follow the commentaries of the lecturer. These books were, Bishop Sanderson's Logic,[*] and Kepler's Treatise on Optics, from which it is evident the young learner must have made considerable progress in the elements of geometry when studying at Grantham. After Newton went to Cambridge, the process of the unfolding of his intellect, a subject so interesting in the study of the human mind, fortunately remains to us either described by himself or established in literary monuments, by which we are enabled accurately to trace its progress.

At this epoch, Descartes bore sway both in speculative and in natural philosophy. The authority of the metaphysical systems of his daring and fertile mind having succeeded to the empire which those of Aristotle had previously exercised, caused his method and his works to be adopted also in mathematics. Hence the geometry of Descartes was one of the first books that Newton read at Cambridge.

After Newton's persevering efforts, when reading alone, to make himself master of the elements of this science, explained so unconnectedly and imperfectly by other authors, he must have felt a lively pleasure on entering on the wide career that the French analyst was the first to open, and in which, having shown the connexion between algebraical equations and geometry, he discovers to us the use of that relation in solving, almost at sight, problems which, up to that time, had foiled the efforts of all the ancient and modern mathematicians. It is singular, however, that Newton, in his writings, has never mentioned Descartes favourably; and, on more than one occasion, has treated him with injustice.[†] He next proceeded, when about twenty-one years old, to read the works of Wallis, and appears to have taken peculiar delight in studying the remarkable treatise of this analyst, entitled *Arithmetica infinitorum*. It was his custom, when reading, to note down what appeared to him capable of being improved; and, by following up the ideas of Wallis, he was led to many important discoveries: for instance, Wallis had given the quadrature of curves, whose ordinates are expressed by any integral and positive power of $(1-x^2)$; and had observed, that if, between the areas so calculated, we could interpolate the areas of other curves, the ordinates of which constituted, with the former ordinates, a geometrical progression, the area of the curve, whose ordinate was a mean proportional between 1 and $(1-x^2)$ would express a circular surface, in terms of the square of its radius. In order to effect this interpolation, Newton began to seek, empirically, the arithmetical law of the co-efficients of the series already obtained.* Having found it, he rendered it more general, by expressing it algebraically. He then perceived that this interpolation gave him the expression in series of radical quantities, composed of several terms; but, not blindly trusting to the induction that had conducted him to this important result, he directly verified it by multiplying each series by itself the number of times required by the index of the root, and he found, in fact, that this multiplication re-produced exactly the quantity from which it had been deduced. When he had thus ascertained that this form of series really gave the development of radical quantities, he was obviously led to consider that they might be obtained still more directly, by applying to the proposed quantities the process used in arithmetic for extracting roots. This attempt perfectly succeeded and again gave the same series, which he had previously discovered by indirect means; but it made them depend on a much more general method, since it permitted him to express, analytically, any powers whatever of polynomials, their quotients, and their roots; by operating upon and considering these quantities as the developments of powers corresponding to integral, negative, or fractional exponents. It is, in fact, in the generality and in the uniformity given to these developments in which the discovery of Newton really consists: for Wallis had remarked before him, with regard to monomial quantities, the analogy of quotients and roots, with integral powers, expressed according to the notation of Descartes; nay, more, Pascal had given a rule for forming, directly, any term of an expanded power of a binomial, the exponent being an integer. But whatever might be the merit of these observations, they were incomplete, and wanted generality, from not being expressed in an algebraical form. In fact, this step made by Newton was indispensable for discovering the development of functions into infinite series. Thus was found out the celebrated formula of such constant use in modern analysis, known by the name of the *Binomial Theorem of Newton*; and not only did he discover it, but he further perceived that there is scarcely any analytical research in which the use of it is not necessary, or at least possible. He immediately made a great number of the most important of these applications, solving, in this way, by series, with unexampled facility and exactness, questions which, up to that time, had not even been attempted, or of which solutions had been obtained only when the real difficulties of the case were removed by particular limitations. It was thus that he obtained the quadrature of the hyperbola and of many other curves, the numerical values of which he amused himself in computing to as many decimal places nearly as had previously been employed in the case of the circle alone: such pleasure did he take in observing the singular effect of these new analytical expressions, which, when capable of being determined exactly, stopped after a certain number of terms; and, in the opposite case, extended themselves indefinitely, while approximating more and more to the truth. Nor did he confine his application of these formulæ to the

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[*] These details of the infancy of Newton are taken chiefly from "*Collections for the History of the Town and Soke of Grantham, containing authentic Memoirs of Sir Isaac Newton, &c.* by *Edmund Turner*, (London, 1806.)" And from the *Eloge on Newton*, written by Fontenelle.

[*] The title is *Logicæ artis Compendium, auctore Robert Sanderson. Oxon.* 8vo.

[†] Particularly in his Optics, where he attributes the discovery of the true theory of the rainbow to Antonius de Dominis, Archbishop of Spalatro, leaving to Descartes only the merit of having "*mended* the ex-

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plication of the exterior bow;" and yet every impartial reader, who refers to the original works, will see that the theory of Descartes is exact and complete, either as to the cause of *the bow*, its formation, or its size, and that he was only unacquainted with the cause of the *different colours*; and even, notwithstanding his ignorance relative to this part of the phenomenon, Descartes, with great sagacity, refers it to another experimental fact, by assimilating it to the colours formed by prisms. It is this formation of colours that Newton has so completely explained by the unequal refrangibility of the rays of light; but all the rest of the explanation is due to Descartes. The book of Dominis contains absolutely nothing but explications entirely vague, without any calculation or real result.

* These details are mentioned by Newton himself, in a letter sent through Oldenburg to Leibnitz, dated October 24, 1676. It is No. LV. in the *Commercium Epistolicum*, published by order of the Royal Society of London.

areas of curves and their rectification, but extended it to the surfaces of solids, to the determination of their contents, and the situation of their centres of gravity. To understand how this method of reducing into series could conduct him to such results, we must recollect that, in 1665, Wallis, in his *Arithmetica infinitorum*, had shown that the area of all curves may be found whose ordinate is expressed by any integral power of the abscissa; and he had given the expression for this area in terms of the ordinate. Now, by reducing into series the more complicated functions of the abscissa which represent the ordinates, Newton changed them into a series of monomial terms, to each of which he was able to apply the rule of Wallis. He thus obtained as many portions of the whole area as there were terms, and by their addition obtained the total. But the far more extensive, and, in some respects, unlimited applications that Newton made of this rule, depended on a general principle which he had made out, and which consisted in the determining, from the manner in which quantities gradually increase, what are the values to which they ultimately arrive. To effect this, Newton regards them not as the aggregates of small homogeneous parts, but as the results of continued motion; so that, according to this mode of conception, lines are described by the movement of points, surfaces by that of lines, solids by that of surfaces, and angles by the rotation of their sides. Again—considering that the quantities so formed are greater or smaller in equal times, according as the velocity with which they are developed is more or less rapid, he endeavours to determine their ultimate values from the expression for these velocities, which he calls *Fluxions*, naming the quantities themselves *Fluents*. In fact, when any given curve, surface, or solid is generated in this manner, the different elements which either compose or belong to it, such as the ordinates, the abscissæ, the lengths of the arcs, the solid contents, the inclinations of the tangent planes, and of the tangents, all vary differently and unequally, but nevertheless according to a regular law depending on the equation of the curve, surface, or solid under consideration.

Hence Newton was able to deduce from this equation the fluxions of all these elements, in terms of any one of the variables, and of the fluxion of this variable, considered as indeterminate; then, by expanding into series, he transformed the expression, so obtained, into finite, or infinite series of monomial terms, to which Wallis's rule became applicable: thus, by applying it successively to each, and taking the sum of the results, he obtained the ultimate value, i. e. *the fluent* of the element he had been considering. It is in this that the method of fluxions consists, of which Newton from that time laid the foundation; and which, eleven years later, Leibnitz again discovered, and presented to the world in a different form, that, namely, of the modern *Differential calculus*. It were impossible to enumerate the various discoveries in mathematical analysis, and in natural philosophy, that this calculus has given rise to; it is sufficient to remark, that there is scarcely a question of the least difficulty in pure or mixed mathematics that does not depend on it, or which could be solved without its aid. Newton made all these analytical discoveries before the year 1665, that is, before completing his twenty-third year. He collected and arranged them in a manuscript, entitled "*Analysis per æquationes numero terminorum infinitas*." He did not, however, publish, or even communicate it to any one, partly, perhaps, from a backwardness to attain sudden notoriety, though more probably from his having already conceived the idea of applying this calculus to the determination of the laws of natural phenomena, anticipating that the analytical methods which he had discovered would be to him instruments for working out the most important results. It is at least certain, that, satisfied with the possession of this treasure, he kept it in reserve, and turned his attention more closely towards objects of natural philosophy. At this time (1665), he quitted Cambridge to avoid the plague, and retired to Woolsthorpe. In this retreat he was able to abandon himself, without interruption, to that philosophical meditation which appears to have been essential to his happiness.

The following anecdote is related by Pemberton, the contemporary and friend of Newton.—Voltaire, in his 'Elements of Philosophy,' says that Mrs. Conduit, Newton's niece, attested the fact.

One day, as he was sitting under an apple-tree, (which is still shown) an apple fell before him; and this incident awakening, perhaps, in his mind, the ideas of uniform and accelerated motion, which he had been employing in his method of fluxions, induced him to reflect on the nature of that remarkable power which urges all bodies to the centre of the earth; which precipitates them towards it with a continually accelerated velocity; and which continues to act without any sensible diminution at the tops of the highest towers, and on the summits of the loftiest mountains. A new idea darted across his mind. "Why," he asked himself, "may not this power extend to the moon, and then what more would be necessary to retain her in her orbit about the earth?" This was but a conjecture; and yet what boldness of thought did it not require to form and deduce it from so trifling an accident! Newton, we may well imagine, applied himself with all his energy to ascertain the truth of this hypothesis. He considered, that if the moon were really retained about the earth by terrestrial gravity, the planets, which move round the sun, ought similarly to be retained in their orbits by their gravity towards that body.[*] Now, if such a force exists, its constancy or variability, as well as its energy at different distances from the centre, ought to manifest itself in the different velocity of the motion in the orbit; and consequently, its law ought to be deducible from a comparison of these motions. Now, in fact, a remarkable relation does exist between them, which Kepler had previously found out by observation, namely, that the squares of the times of revolution of the different planets are proportional to the cubes of their distances from the sun. Setting out with this law, Newton found, by calculation, that the force of solar gravity decreases proportionally to the square of the distance; and it is to be observed that he could not have arrived at this result without having discovered the means of determining from the velocity of a body in its orbit, and the radius of the orbit supposed to be circular, the effort with which it tends to recede from the centre; because it is this effort that determines the intensity of the gravity, (to which, in fact, the effort is equal.) It is precisely on this reasoning, that the beautiful theorems on centrifugal force, published six years afterwards by Huygens, are founded; whence it is plain that Newton himself must necessarily have been acquainted with these very theorems. Having thus determined the law of the gravity of the planets towards the sun, he forthwith endeavoured to apply it to the moon; that is to say, to determine the velocity of her movement round the earth, by means of her distance as determined by astronomers, and the intensity of gravity as shown by the fall of bodies at the earth's surface. To make this calculation, it is necessary to know *exactly* the distance from the surface to the centre of the earth, expressed in parts of the same measure that is used in marking the spaces described, in a given time, by falling bodies at the earth's surface; for their velocity is the first term of comparison that determines the intensity of gravity at this distance from the centre, which we apply afterwards at the distance of the moon by diminishing it proportionally to the square of her distance. It then only remains to be seen, if gravity, when thus diminished, has precisely the degree of energy necessary to counteract the centrifugal force of the moon, caused by the observed motion in her orbit. Unhappily, at this time, there existed no correct measure of the earth's dimensions. Such as were to be met with, had been made only for nautical purposes, and were extremely imperfect. Newton, having no other resource but to employ them, found that they gave for the force that retains the moon in her orbit, a value greater by $\frac{1}{6}$ than that which results from her *observed* circular velocity. This difference, which would, doubtless, to any other person, have appeared very small, seemed, to his cautious mind, a proof sufficiently decisive against the bold conjecture which he had formed. He imagined that some unknown cause, analogous, perhaps, to the vortices of Descartes,[*] modified, in the case of the moon, the general law of gravity indicated by the movement of the planets. He did not, however, on this account, wholly abandon his leading notion, but, in conformity with the character of his contemplative mind, he resolved not yet to divulge it, but to wait until study and reflection should reveal to him the unknown cause which modified a law indicated by such strong analogies. This took place in 1665-6. During the latter year, the danger of the plague having ceased, he returned to Cambridge, but he did not disclose his secret to any one, not even to his instructor, Dr. Barrow. It was not till two years afterwards, 1668, that Newton communicated to the latter, who was then engaged in publishing his lectures on Optics, certain theorems relating to the optical properties of curved surfaces, of which Barrow makes very honourable mention in his preface. Newton had now become a colleague of his former tutor, having been admitted master of arts the preceding year. At length in the same year (1668) an occurrence in the scientific world compelled him to declare himself. Mercator* printed and published, towards the end of this year, a book called *Logarithmotechnia*, in which he had succeeded in obtaining the area of the hyperbola referred to its asymptotes, by expanding its ordinate into an infinite series; this he did *by means of common division*, as Wallis had done in the case of fractions of the form $\frac{1}{1-x}$: then, considering each term of this series separately, as representing a particular ordinate, he applied to it Wallis's method for curves, whose ordinates are expressed by a single term, and the sum of the partial areas so obtained, gave him the value of the whole area. This was the *first* example *given to the world* of obtaining the quadrature of a curve by expanding its ordinate into an infinite series. And it was also the main secret in the general method which Newton had invented for all problems of this nature. The novelty of the invention caused it to be received with general applause. Collins, a gentleman well known to science and philosophy at that time, hastened to send Mercator's book to his friend Barrow, who communicated it to Newton. The latter had no sooner glanced over it, than recognizing his own fundamental idea, he immediately went home, to find the manuscript; in which he had explained his own method, and presented it to Barrow; this was the treatise *Analysis per æquationes numero terminorum infinitas.* Barrow was struck with astonishment at seeing so rich a collection of analytical discoveries of far greater importance than the particular one which then excited such general admiration. Perhaps, too, he must have been still more surprised at their young author having been able to keep them so profoundly secret. He immediately wrote about them to Collins, who, in return, entreated Barrow to procure for him the sight of so precious a manuscript. Collins obtained his request, and happily, before returning the work, took a copy of it, which being found after his death, among his papers, and published in 1711, has determined beyond dispute, by the date which it bore, at what period Newton made the memorable discovery of expansion by series, and of the method of fluxions. It would have been natural to suppose that an interference with his own discoveries would at last have induced Newton to publish his methods; but he preferred still to keep them secret. "I suspected," says he, "that Mercator must have known the extraction of roots, as well as the reduction of fractions into series by division, or at least, that others, having learnt to employ division for this purpose, would discover the rest before I myself should be old enough to appear before the public, and, therefore, I began henceforward to look upon such researches with less interest."*

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[*] Newton afterwards shewed the truth of this result, by deducing it from a law observed by Kepler, in the movement of all the planets, which consists in the description of areas proportional to the times, by the radius vector drawn from each planet to the sun: but he did not know how to make use of this law till he had discovered the means of calculating the motion in an elliptic orbit; that is, about the end of the year 1679.

[*] Vide Whiston's *Memoirs of Himself*, page 23, &c.

It were difficult to explain this reserve and indifference by the feelings of extreme modesty alone; but we may come near the truth by considering what were the habits of Newton, and by figuring to ourselves the new and extraordinary allurements of another discovery which he had just made, and which he already enjoyed in secret; for in general, the effort of thinking was with him so strong, that it entirely abstracted his attention from other matters, and confined him exclusively to one object. Thus we know that he never was occupied at the same time with two different scientific investigations. And we find,† even in the most beautiful of his works, the simple, yet expressive avowal of the disgust with which his most curious researches had always finally inspired him, from his ideas being continually, and for a long time, directed to the same object. This might, perhaps, also have in part been caused by a discouraging conviction, that he would seldom be understood and followed in the chain of his reasoning; since others, in order to do so, must be as deeply immersed in the subject and as abstracted from other matters as himself. Be this as it may, when Mercator's work appeared, a new series of discoveries of a totally different nature had taken hold of Newton's thoughts.

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* Born in Holstein: he passed the greater part of his life in England.

* Com. Epist. LVI.

† At the end of the Optics.

In the course of 1666, he had accidentally been led to make some observations on the refraction of light through prisms. These experiments, which he had at first tried merely from amusement, or curiosity, soon offered to him most important results. They led him to conclude that light, as it emanates from radiating bodies, such as the sun, for instance, is not a simple and homogeneous substance, but that it is composed of a number of rays endowed with unequal refrangibility, and possessing different colouring properties. The inequality of the refraction undergone by these rays in the same body, when they enter at the same angle of incidence, enabled him to separate them; and thus, having them unmixed and pure, he was able to study their individual properties. But the breaking out of the plague, which in this year compelled him to take refuge in the country, having separated him from his instruments, and deprived him of the means of making experiments, turned his attention to other objects. More than two years elapsed before he returned to these researches, on finding himself about to be appointed lecturer on optics in room of Dr. Barrow, who in 1669 generously retired in order to make way for him. He then endeavoured to mature his first results, and was led to a multitude of observations no less admirable from their novelty and importance, than for the sagacity, address, and method, with which he perfected and connected them. He composed a complete treatise, in which the fundamental properties of light were unfolded, established, and arranged, by means of experiment alone, *without any admixture of hypothesis*, a novelty at that time almost as surprising as these properties themselves. This formed the text of the lectures he began in Cambridge 1669, when scarcely twenty-seven years old, and thus we see, from what we have related concerning the succession of his ideas, that the *method of Fluxions*, the *theory of universal gravitation*, and the *decomposition of light*, i. e. the *three grand discoveries which form the glory of his life*, were *conceived in his mind before the completion of his twenty-fourth year.*

Although the lectures of Newton on optics must inevitably in the end have given publicity to his labours on light, he still refrained from publishing, wishing probably to reserve to himself the opportunity of adding a complete analysis of certain curious properties, of which, as yet, he had had but a slight glimpse. We refer to the intermittences of reflection and refraction which take place in thin plates, and perhaps in the ultimate particles of all bodies. It was not till two years later, that he made known some of his researches, and soon afterwards he was induced to give them full publicity. In 1671 he had been proposed as a Fellow of the Royal Society of London, and was elected on the 11th of January, 1672. In order that he might be qualified to receive this distinction, the rules of the society required that he should declare himself desirous of becoming a Fellow, and he could not do so in a more honourable manner than by offering some scientific communication. He forwarded to them a description of a new arrangement for reflecting telescopes, which rendered them more commodious in use by diminishing their length without weakening their magnifying powers. With regard to this invention, in which Newton had been preceded, probably without knowing it, by Gregory the Scotch mathematician, and by a Frenchman of the name of Cassegrain, it is merely necessary to observe that the construction offers in practice some inconveniences, which cause it to be little used. Nevertheless, when he presented a model of it,* of his own construction, it made a great impression in his favour among the members of the society, to whom probably the construction of Gregory's telescope was not yet well known. The letter which Newton wrote to the society on this occasion, ends with the following characteristic expression:—"I am very sensible of the honour done me by the Bishop of Sarum, in proposing me Candidate, and which I hope will be further conferred upon me by my election into the society, and if so, I shall endeavour to testify my gratitude by communicating what my poor and SOLITARY endeavours can effect towards the promoting philosophical design."* The favourable reception which this proposal met with, induced Newton two months afterwards to make to the Royal Society another much more important communication, viz. the first part of his labours on the analysis of light. We can easily imagine the sensation which so great and unexpected a discovery must have produced. The society requested of him, in the most flattering terms, permission to insert this beautiful Treatise in the Philosophical Transactions.† Newton accepted this speedy and honourable method of publication; and in addressing his thanks to Oldenburg, their secretary, he says:—"It was an esteem of the Royal Society, for most candid and able judges in philosophical matters, encouraged me to present them with that discourse of light and colours, which since they have so favourably accepted of, I do earnestly desire you to return them my cordial thanks. I before thought it a great favour to be made a member of that honourable body, but I am now more sensible of the advantage: for believe me, Sir, I do not only esteem it a duty to concur with them in the promotion of real knowledge, but a great privilege that, instead of exposing discourses to a prejudiced and censorious multitude, (by which means many truths have been baffled and lost,) I may with freedom apply myself to so judicious and impartial an assembly."‡ It is but fair to say, for the honour of the Royal Society, that it has always shown itself, more than any other, worthy of this noble testimony which the most illustrious of its members has rendered to its justice. But though the suffrage and esteem of such a society may make amends for, yet they cannot prevent individual attacks. Newton himself was compelled to submit to the common destiny, which ordains that merit, and more particularly success, shall give rise to envy. By unveiling himself, he obtained glory, but at the price of his repose. At this period, Robert Hooke was a fellow of the Royal Society, a man of extensive acquirements, and of an original turn of thought, with great activity of mind and an excessive desire of renown. There were few departments of human knowledge to which he had not paid more or less attention: so much so, indeed, that it was hardly possible to find any subject of research upon which he did not profess to have original views; or to propose any new invention of which he did not claim the prior discovery. There was then the more opportunity of setting in action and of gratifying his jealous spirit, as all the physical and natural sciences were, at that time, mixed up with theoretical opinions; and there were few men then to be met with who could distinguish the difference between a vague perception and a precise idea—between a physical hypothesis and a law of nature rigorously demonstrated. Hooke himself was no exception to this remark; and unfortunately he was not sufficiently familiar with pure mathematics to make use of them as a means of calculation, either in proving or perfecting a theory. A thorough acquaintance with this instrument was the great advantage possessed by Newton, and which assured to his researches a precision and a certainty hitherto unknown in science. The investigation of the properties of light presented by him to the Royal Society, eminently possessed this rigorous character. It consisted in showing experimentally a certain number of physical properties, which were thus established as matters of fact without any admixture of hypothesis, and without requiring any previous knowledge in what the nature of light consisted. When the first feelings of surprise and admiration excited by this noble work had subsided, the Royal Society appointed three members, to study the treatise fully, and to give an account of it. Hooke, being one of the number, undertook to draw up the report. Already on the occasion of Newton presenting his telescope, Hooke had announced that he possessed an infallible method of improving all sorts of optical instruments, so that* "whatever almost hath been in notion and imagination, or desired in optics, may be performed with great facility and truth." Nevertheless, he did not explain this method, but confined himself, in accordance with the conceits of his day, to masking it under the form of an anagram; of which, however, he appears not to have been able to produce the explanation, since neither he nor any other person has ever realised these wonderful promises. His report on Newton's work was, if not of the same kind, yet conceived in the same spirit of personality: for, instead of discussing the new facts, singly, and as compared with the original experiments, he examined them only in relation to an hypothesis which he had formerly imagined, and which consists in regarding light not as an emanation of very small particles, but as the simple effect of vibrations excited and propagated in a very elastic medium. This conception of the nature of light may be in itself as true as any other, since that nature is still entirely unknown to us; but, in order to place such an hypothesis on an equal footing with another hypothesis, shown by calculation to be consistent with experiment and observation, it ought to be detailed with exactness, and to be rigorously accordant with mathematical calculation. The first of these conditions was far from being fulfilled by Hooke, who substituted in its stead a sketch exceedingly vague, and materially contrary to experiment. He supposed, for instance, that there are only two colours essentially distinct, namely, the violet and the red, of which all the others are but mixtures.

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* This model, made by Newton himself, is still preserved in the Library of the Royal Society.

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* Birch, vol. iii. p. 3.

† At that time published in monthly numbers, by the Royal Society.

‡ Dated Trinity College, February 10th, 1671.

* Birch, vol. iii. p. 4.

With regard to the second condition, viz., an accordance with calculation, it was then far from possible to submit the system of undulations to rigorous mathematical investigation; since that is more than even, at the present time, those mathematicians have been able to accomplish who have been most occupied with the subject. To so vague a theory did Hooke refer, as a standard, the physical truths which Newton had discovered. He concluded by dictatorially allowing all that appeared to him to be reconcileable with his own hypothesis, and by advising him not to seek any other explanation of the facts.[*] Newton replied to this attack in a severe and decisive tone.[†] After refuting an error that Hooke had committed, in supposing the spherical aberration in reflectors greater than that in refracting lenses, he shows that Hooke had judged of the facts he had announced, not by means of the observations that supported them, but by their accordance or discordance with a previously conceived hypothesis; that this hypothesis was vague and unsatisfactory, and that, for his own part, he had not wished to support any hypothesis whatever, as in fact he had no need of one, but that he had only aimed at establishing the real properties of light upon actual observation. Finally, he adduced new experiments, confirming the results which he had already obtained, and refuted the inaccurate assertions of Hooke with respect to the possibility of reducing all colours to two simple ones; as well as his objections to the production of whiteness by the mixture of all the rays. This paper, which nearly completed Newton's investigation into the properties of light, was published by the Royal Society in the Philosophical Transactions of Nov. 1672. Hooke did not reply to this, but presuming, and with good reason, after Newton's first treatise, that such an experimentalist would soon be on the track of all that remained to be discovered concerning the physical properties of light, he hastened to present to the Royal Society several important observations on optics. Among them, we may remark a very precise and faithful account of the changeable colours that appear in the form of rings on soap bubbles, and in the thin plates of air included between pieces of glass pressed together; but without any determination of the physical law or measure even of the breadth and intervals of the rings. Two years afterwards (18th of March, 1674), he read another memoir, in which he detailed the fundamental phenomena of *diffraction*, which had been already discovered and described by Grimaldi;[*] but, what is still more remarkable, he then announced another principle, which, under the name of the *principle of interferences*, has since become one of such frequent and advantageous application.

This principle is, that colours are produced when two rays of white light arrive simultaneously at the eye, having directions so little different that this organ takes them to be one ray. We shall afterwards see that (as Hooke had anticipated) Newton was induced subsequently to occupy himself with these new phenomena; but, in the mean time, he was exposed to several absurd attacks upon his experimental analysis of light. Such, for instance, was that of a Jesuit named Pardies, who pretended that the elongation of the refracted image, whence Newton inferred the unequal refrangibility of the rays, was produced entirely by a difference in their original incidences on the first face of the prism: a supposition, the inaccuracy of which the most simple calculation would have been sufficient to show; and which Newton had previously refuted in his own Memoir. But still more foolish was the assertion of one Linus, a physician of Liege, who pretended never to have been able to produce by refraction through a prism an *elongated* image, but only a *round* and *colourless* one; whence he concluded that Newton had been led into error by the accidental passage of some bright cloud, which had elongated and coloured the image; adding also that he himself should not have been astonished had the image been elongated in the longitudinal direction of the prism; but that, without violating the rules of optics, it was impossible to imagine its elongation in the transverse direction. This was accompanied by several authoritative remarks on the improbability of what he called the new *hypothesis*, which Newton had imagined simply to be a statement of facts. These absurdities, as soon as presented, were printed in the Philosophical Transactions; and Newton was obliged to take the trouble to answer them methodically, to prevent their being accredited by that envy which showed itself so eager to receive them. He was compelled to reply to Huygens, who, though really a man of talent, made objections as unphilosophical nearly as the others, since he compared the properties discovered experimentally by Newton with an hypothesis of his own on the nature of light, in the same manner as Hooke had compared them with his hypothesis, and Pardies and Linus with the ancient ones. In vain did Newton reply that he neither advanced nor admitted any hypothesis whatever, but that his sole object was to establish and connect facts by means of the laws of nature. This severe and abstract method of reasoning was then too little understood. It is scarcely conceivable into what details he was obliged to enter in the discussion; and such was the disgust with which this inspired him, that he gave up his previous intention of printing his lectures on Optics with his treatise on Series, and determined to commit himself no more with the public.* "I was," he afterwards wrote to Leibnitz, "so persecuted with discussions arising from the publication of my theory of light, that I blamed my own imprudence for parting with so substantial a blessing as my quiet, to run after a shadow." It was, perhaps, the remembrance of these inconsiderate objections of Huygens, that afterwards inclined Newton to regard less favourably than he ought to have done, the law of double refraction in Iceland spar, discovered by this eminent mathematician, probably by experiment after Newton's own manner, though he presented it as a deduction from his own favourite system, and as a confirmation of it. It is easy to understand how much Newton must have been grieved by the opposition of so illustrious an adversary as Huygens, since he might at least have hoped to have been understood and appreciated by minds accustomed to the severity of mathematical investigations. Nevertheless, before quitting the lists, Newton wished finally to complete the account of the results which he had obtained, and of the views which he had formed on the nature of light. This was the object of a later paper addressed to the Royal Society.†

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[*] Birch, Hist. R.S. vol. iii. p. 10.

[†] Philosoph. Transact. vol. vii. No. 88.

[*] These discoveries were given to the world in Grimaldi's posthumous work, *Physico-mathesis de lumine, &c.* (Bononiæ, 1665, in 4to.)—a book also containing the undulatory hypothesis afterwards reproduced by Hooke. Vide Montucla, Histoire des Mathématiques, vol. ii.

We there find an experimental analysis of the colours observed in thin plates—phenomena, which, as we have said, had been previously pointed out and described by Hooke, but without his having either measured the spaces occupied by the colours, or determined the law which they followed. Newton first measured the spaces with admirable precision and nicety, and thence derived the physical laws by which all these results are connected with, and may be deduced from each other.

This treatise, united with his first paper on the analysis of Light, afterwards served as a base for the grand work published in 1704, under the name of *Newton's Treatise on Optics;* with this difference, however, that in the latter work the experimental investigation of the phenomena is more extensive and more strictly separated from all hypothesis. The new experiments with which Newton enriched it, relate principally to the colours observed in the *thick* plates of all bodies, when they are presented in a proper manner to the incident ray. Newton reduces them to the same laws as those of the phenomena in *thin* plates; and then considering these laws as established facts equally certain with the particular experiments from which they are deduced, yet far more universal, he unites them all in one general property of light, each peculiarity of which is characterized with such exactness, as to make the general property a pure expression for all the observed laws. The essence of this property is, that each particle of light, from the instant when it quits the radiating body whence it emanates, is subject periodically and at equidistant intervals, to a continual alternation of dispositions to be reflected from or to be transmitted through the surfaces of the diaphanous bodies it meets with; so that, for instance, if such a surface presents itself to the luminous particle during one of the alternations when the tendency to reflection is in force, which Newton has appropriately termed *the fit of easy reflection*, this tendency makes it yield more *easily* to the reflecting power of the surface; while, on the other hand, it yields with more *difficulty* when it is in the contrary phase, which Newton has termed the *fit of easy transmission*. We have here an admirable example of the universal application of scientific definitions when framed in strict accordance with experiment. For, though the term *fits*, inasmuch as it seems to imply a physical property, is applicable in its first intention to material particles only, and thus involves the assumption of the materiality of light, (a fact of which we may reasonably doubt, though Newton has never treated it as doubtful,) yet the characteristics of these fits are described in such exact conformity with experiment, that they would exist without any change, even were it discovered that light is constituted in any other manner—that it consists, for instance, in the propagation of undulations: such is the point of view in which Newton regards these fits in his Optics, 1704, limiting himself to deduce from them his profound inductions, on the intimate constitution of bodies, and on the cause which renders them apt to reflect or transmit a particular colour. But in his paper of 1675, he connected these properties with a very bold physical hypothesis, so general, that, from it, he deduced the nature of light and of heat, and the explanation of all the phenomena of combination or motion which appear to result from certain intangible and imponderable principles. As this hypothesis (mentioned only in the History of the Royal Society) is little known, and as it appears to have been constantly connected with Newton's thoughts on the constitution of the universe, we may here give a summary of it. We do this without the intention either of defending or combating it, but in order that the reader may see precisely in what the general views of Newton from this time forward consisted, and how, while they continued unchanged by lapse of time, he made a more or less explicit declaration of them according to circumstances. Newton, in the first place, excuses himself for proposing a conjecture as to the nature of light, declaring that he does not need one, and that the properties which he has discovered being physical facts, their being explicable or not by this or that hypothesis, could not in any degree add to or take away from their certainty;* "but," says he, "because I have observed the heads of some great virtuosos to run much upon hypotheses, I will give one which I should be inclined to consider as the most probable, if I were obliged to adopt one." He then admits, nearly as Descartes had previously done, the existence of a fluid imperceptible to our senses, which extends everywhere in space, and penetrates all bodies, with different degrees of density. He supposes this fluid to be more dense in bodies which contain in the same volume a less number of constituent material particles; he supposes also that the density of this fluid varies around each different body, and even around each constituent particle, increasing rapidly near their surface, and afterwards more slowly, though by insensible degrees, as the distance from the surface becomes greater. This fluid (which Newton calls *ætherial medium or æther*, in order to characterize by this denomination its extreme tenuity) he also considered as highly elastic; and consequently by the effort which it makes to spread, that it presses against itself, and against the material parts of other bodies, with an energy more or less powerful according to its actual density, and thus that all these bodies continually tend towards one another; the inequality of the pressure urging them always to pass from the denser into the rarer parts of the æther. Conformably to his opinion respecting the disposition of the æther around each body, and around each of its material constituent particles, he considered that the variations of its density between a body and a vacuum, or between one body and another neighbouring body, were not sudden and discontinuous, but gradual and progressive; and from being very rapid near the surfaces, where the nature or density of the matter instantaneously changes, they a little farther become so slow as soon to cease to be perceptible beyond certain limits of thickness inappreciable to our senses. If, then, this æther be disturbed or agitated, in any one point, by any cause whatever, producing a vibratory movement, this motion must transmit itself by undulations through all the rest of the medium, in the same way that sound is transmitted through air, but much more rapidly, by reason of the æther's greater elasticity; and, if those undulations, successively reiterated, happen to encounter in their passage the material particles forming the substance of any body, they will agitate them with considerable force, by the quick and periodical repetition of their successive impressions, in precisely the same way that we see solid bodies, and sometimes even the whole mass of a large building, tremble under reiterated impulses of the weak undulations in the air, excited by the sounds of an organ, or by the rolling of a drum.

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* Comm. Epist. LVII.

† Dated 9th Dec. 1675. Birch, vol. iii. pp. 247, 261, 296.

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* Birch, Hist. R.S. vol. iii, p. 249.

Now Newton does not suppose that light immediately results from the impression produced by these undulations on the nervous membrane of the retina, as Descartes and Hooke had previously done, and as, in general, has been done by all those who have followed the same system. The principal reason which Newton gives for rejecting this supposition is, that a motion excited in, and transmitted through, an elastic fluid which reposes on another fluid of a different density, does not seem capable of being reflected in the first fluid at their surface of common separation, without being in part transmitted into the second; whereas, in many cases, light, propagated into the interior of bodies, is totally reflected at their second surface, and again returns into their interior without the smallest part of it going out. Newton, therefore, admits that light consists of a peculiar substance different from the æther, but composed of heterogeneous particles, which, springing in all directions from shining bodies, with an excessive though measurable velocity, agitate the æther in their passage, and excite in it undulations; by the meeting of which, they become liable to be in their turn accelerated or retarded. Newton does not attempt to characterize the essence of these particles, but merely the faculty that he attributes to them of agitating the æther, and of being agitated by it; and finally he adds,* "those that will, may suppose it, multitudes of unimaginable small and swift corpuscules of various sizes springing from shining bodies at great distances one after another; but yet without any sensible interval of time; and continually urged forward by a principle of motion, which, in the beginning, accelerates them till the resistance of the ætherial medium equal the force of that principle, much after the manner that bodies let fall in water are accelerated, till the resistance of the water equals the force of gravity." Be this as it may, the independence of the particles of light and of æther being admitted, as well as their mutual reaction, Newton takes the case of a ray of light moving through a space in which the ætherial medium is composed of strata of unequal density; and applying to the particles of this ray the general principle established above, he concludes that they ought to be pressed, urged, or generally acted upon, so as to go from the denser to the rarer strata of æther; whence they must receive an accelerated velocity, if this tendency conspire with the proper motion of the ray; and a retarded velocity, if it be contrary to it; and generally a curvilinear deviation when the proper motion of the ray and the impression produced by the elastic medium are oblique to one another.

This is precisely what must happen when rays of light pass from one transparent homogeneous body into another, since the æther is there supposed to be of different densities; and the deviation of the rays takes place only near the common surface of the two bodies, where the sensible variation of density begins, whence results the phenomenon of refraction.* "Now," says Newton, "if the motion of the ray be supposed in this passage to be increased or diminished in a certain proportion, according to the difference of the densities of the ætherial mediums, and the addition or detraction of the motion be reckoned in the perpendicular from the refracting superficies, as it ought to be, the sines of incidence and refraction will be proportional, according to what Descartes has demonstrated." This explanation of refraction is exactly the same as Newton afterwards reproduced in the *Principia*, though without there pronouncing any opinion on the nature of the disturbing force. It is, however, probable, that in his Memoir he deduced it by simple induction, rather than by a mathematical investigation; for it does not appear that, at this epoch, he was acquainted with the calculation of curvilinear motions. It is, however, important to remark, that from this time he had formed a conception of the doctrine of universal gravitation; for he takes care to point out that the unequal density of the æther, at different distances from the surface of bodies, suffices to determine their mutual tendency towards one another; a consideration which he again brought forward in the Queries annexed to his Optics (in 1704), after he had discovered the laws of the system of the world. Nevertheless we may infer, that in 1675, he had not yet formed the idea of attractions at small distances, since, in his paper addressed to the Royal Society, he imagines that the ascent of liquids in capillary tubes is caused by the air being more rare in confined than in open spaces, and the more rare in proportion as the spaces are more confined. While in the Queries he attributes these phenomena to their true cause, viz. to the reciprocal attractions of the tubes and of the fluid; though, even at this later period, he did not know how to calculate their effect. It was reserved for LAPLACE to complete this investigation.

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* Birch, Hist. R. S. vol. iii. pp. 254, 5.

After having thus considered the simple transmission of rays in ætherial strata of unequal densities, Newton examines the modifications produced during this transmission, by their meeting with undulations originally excited in the æther itself, according as such undulations may favour or oppose the actual motion of the luminous particles; and by this re-action he is enabled to explain the intermittances in reflection and refraction, which take place in thin plates. We may observe in his Optics, that he has never abandoned this idea; for though in that work he has maintained the most complete reserve with regard to the nature of light, yet, after characterizing the fits as a purely abstract physical property, he gives as a method of rendering it sensible, the same manner of conceiving it that he had given in his Memoir of 1675; the same idea is reproduced in several of the *Queries*, particularly in the 17th, and those following to the 24th, where Newton asks, as in the paper presented to the Royal Society, if this same æther be not also sufficient to produce universal gravitation, and even all the phenomena of animal motion? Finally, in his paper, he endeavours to apply the same principles to the inflections, undergone by rays of light on passing near the extremities of bodies; which he, in like manner, explains by variations in the density of the æther. It is always thus that he has represented these inflections, both in the Principia, printed in 1687, and in the Queries.

From these examples, taken together, we may see that Newton did *not* "several times change his ideas on light," as has been asserted by some writers, but that, always preserving the same opinion, he has explained it more or less fully, as different occasions demanded.

The phenomena of diffraction, how ever, were still too imperfectly known, and observed with too little detail for enabling Newton to see precisely whether they agreed or not with his hypothesis. We have reason to believe that, in order to study these properties, he then made a number of experiments, to be afterwards inserted at the end of the Optics; for he there introduces them as part of an investigation which he had formerly undertaken, but from which his thoughts were now so far estranged, that he had lost the taste for resuming it. These observations, like all his others, are presented as matters of fact, without relation to any system. When the hypothesis of Newton on the nature of light was presented, in 1675, to the Royal Society, Hooke, as usual, put in his claims to it. Newton, however, did not again waste his time and repose in, a controversy on the subject, but contented himself with writing to Olden burg (21st December), in order to make him see the injustice of that jealous individual. He first clearly shows that his fundamental idea has nothing in common with that of Hooke, inasmuch as the latter supposes light to consist in the undulations themselves of the æther, transmitted to the organ of vision; while the light of Newton is a substance entirely distinct, which, thrown into the æther, impresses upon, or receives from it, peculiar motions, by means of which it acts upon us. "As to the observations of Hooke on the colours in thin plates, I avow," says Newton, "that I have made use of them, and thank him for the same; but he left me to find out and make such experiments about it, as might inform me of the manner of the production of those colours, to ground an hypothesis on; he having given no further insight to it than this, that the colour depended on some certain thickness of the plate; though what that thickness was at every colour, he confesses, in his Micrography, he had attempted in vain to learn; and, therefore, seeing I was left to measure it myself, I suppose he will allow me to make use of what I took the pains to find out; and this I hope may vindicate me from what Mr. Hooke has been pleased to charge me with."* Happily this time the discussion proceeded no further; and Oldenburg had sufficient influence, as well as sufficient sense, to prevent its obtaining notoriety. From this time till the year 1679, four years afterwards, Newton communicated nothing to the Royal Society. Oldenburg, whose kindness had ever encouraged him, unfortunately died in this interval, and was succeeded in the secretaryship by Hooke, an appointment little likely to remove an apprehension of new disputes. We may imagine, however, that Newton did not remain idle; and, in fact, in this interval, it appears, he was principally occupied with astronomical observations. At last, 28th November, 1679,† he had occasion to write to Hooke about a System of Physical Astronomy, on which the Royal Society had asked his opinion. In his letter he proposed, as a matter deserving attention, to verify the motion of the earth by direct experiment, viz. by letting bodies fall from a considerable height, and then observing if they follow *exactly* a vertical direction; for if the earth turns, since the rotatory velocity at the point of departure must be greater than that at the foot of the vertical, they will be found to *deviate* from this line towards the east, instead of following it *exactly* as they would do if the earth did not revolve. This ingenious idea being very favourably received, Hooke was charged to put it into effect. On reflection, Hooke immediately added the remark, that wherever the direction of gravity is oblique to the axis of the earth's rotation, *i. e.* in all parts of the earth, except at the equator, bodies, in falling, change parallels, and approach the equator: so that in Europe, for instance, the deviation does not take place, rigorously speaking, to the east, but to the south-east of the point of departure. Hooke communicated this remark to Newton, who immediately recognized its correctness in theory; but, in addition to this, Hooke assured the Royal Society that, on repeating the experiment several times, he had actually found that the deviation took place constantly towards the south-east; an accordance which would appear very simple, if Hooke's remarks were merely theoretical; but which must appear very extraordinary if he intended to speak of an actual *observed* deviation reckoned from the foot of the vertical; for in this case, according to the formulæ of LAPLACE, the tendency to the south is of the second order, relative to the absolute deviation; and in Hooke's observations this very slight deviation must have been excessively difficult to ascertain, since his experiments were made in the open air. It was this, however, which led Newton to consider whether the elliptical motion of the planets could result from a force varying inversely as the square of the distance, and if so, under what circumstances such a result would ensue. In fact, in proposing to the Royal Society his curious experiment, he had considered the motion of the heavy body as determined by a force of constant intensity, and had concluded the trajectory to be a spiral,* doubtless, because he imagined the body to fall in a resisting medium, such as the air. Hooke, who for a long time had adopted the hypothesis of a force decreasing as the squares of the distance from the centre, replied that the trajectory ought not to be a spiral, but that in a vacuum it would be an *excentric ellipse*, which would change into an ovoidal curve likewise excentric, if the medium were a resisting one. It is impossible exactly to ascertain how Hooke arrived at these results, for neither then, nor on any subsequent occasion, did he give a demonstration of them; though Halley and Sir Christopher Wren both eagerly pressed him to do so. We might imagine, not without some probability, that the elliptic movement of projectiles was, in his mind, a consequence of the hypothetical, though just, ideas he had formed on the physical cause of the planetary motions; for he attributed them to the existence of a gravitating force, proper to each celestial body, and acting round its centre, with an energy inversely proportional to the square of the distance; so that, in this system, the motion of projectiles round the centre of the earth ought to be elliptical, because, according to observation, the motion of the planets was elliptical round the sun. Hooke had, for some time, turned his thoughts to this kind of speculation; but not being a sufficiently profound mathematician, rigorously to deduce the nature of the force from the form of the orbits, or to show how this form resulted from the supposed law of attraction, he tried to determine its character by direct physical experiments, and actually to produce the motions which resulted from the law, by means of mechanical contrivances. On the 21st March, 1666, he communicated to the Royal Society certain experiments, which he had attempted, in order to determine whether the weight of a body undergoes any variation at different distances from the earth's centre, at the greatest altitudes or depths which can be attained. These experiments were made with too little precision to give results on which any reliance could be placed. Hooke himself perceived this, and proposed to employ the more delicate process of using a pendulum clock, and successively observing its rate at different heights. This first attempt, though imperfect, shows the object he had in view, which perhaps is more clearly seen in his own words. "Gravity, though it seems to be one of the most universal, active principles in the world, and consequently ought to be the most considerable, yet has it had the ill fate to have been always, till of late, esteemed otherwise, even to slighting and neglect. But the inquisitiveness of this latter age hath begun to find sufficient arguments to entertain other thoughts of it. Gilbert began to imagine it a magnetical attractive power, inherent in the parts of the terrestrial globe. The noble Verulam also, in part, embraced this opinion; and Kepler (not without good reason) makes it a property inherent in all celestial bodies,—sun, stars, planets. This supposition we may afterwards more particularly examine; but first it will be requisite to consider, whether this gravitating or attracting power be inherent in the parts of the earth; and, if so, whether it be magnetical, electrical, or of some other nature distant from either. If it be magnetical, any body attracted by it ought to gravitate more, when nearer to its surface, than when further off.*"

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* Birch, Hist. R.S. vol. iii. p. 256.

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* Birch, Hist. R. S. vol. iii. p. 279.
† Ibid. vol, iii. p. 512.

* Vide Newton's original Letters in the Biographia Britannica, article Hooke, p. 2659.

Two months afterwards, Hooke made before the Royal Society another experiment, which, as he himself observed, without being an exact representation of the planetary orbits, afforded an example, at that time new and remarkable, of a curvilinear motion produced by the combination of a primitive impulse with an attracting power emanating from a centre. He suspended from the ceiling of a room a long wire, to the end of which was attached a ball of wood, to represent a planetary body. On removing this pendulum from the vertical, and giving it a lateral impulse perpendicular to the plane of deviation, it is acted on by two forces, of which one is the impulse itself, and the other terrestrial gravity, of which the effort, when decomposed perpendicularly to the wire, tends always to bring the body back to the vertical. Now when the lateral impulse was nothing, the ball clearly described a plane orbit, viz. that of its free oscillation; if the impulse, without being nothing, were still very weak, the trajectory became a very much elongated ellipse, having its major axis in the plane of oscillation; with a stronger impulse, a more open ellipse was obtained, which, at a particular point, became an exact circle; and lastly, still stronger impulses produced ellipses, whose major axes were no longer parallel with, but were perpendicular to the plane of free oscillation. Thus these different curves were seen to be produced and to be transformed into each other, by merely changing the relative energies of the two forces (the one impulsive, and the other central) which acted on the pendulum. These ellipses, however, differed from the planetary ellipses, inasmuch as the central force produced by the decomposition of gravity is constantly directed towards the *centre* of the ellipse, and is *directly* proportional to the distance of the body from that centre; whereas, in the planetary orbits, the central force is constantly directed towards *one of the foci* of the ellipse, and is *reciprocally* proportional to *the square* of the distance of the body from that point. Notwithstanding this fundamental distinction, the experiment of Hooke was important and useful, as it gave a perceptible example of the composition of forces. Eight years later, in 1674, Hooke presented the whole of his ideas in a much more explicit and complete manner, at the end of a dissertation, entitled, "*An Attempt to prove the Motion of the Earth from Observations.*" * "I shall," says he, "hereafter explain a system of the world, differing in many particulars from any yet known, answering in all things to the common rules of mechanical motions. This depends upon three suppositions:—first, that all celestial bodies whatsoever have an attraction or gravitating power towards their own centres, whereby they attract not only their own parts and keep them from flying from them, as we may observe the earth to do, but that they do also attract all the other celestial bodies that are within the sphere of their activity, and consequently, that not only the sun and moon have an influence upon the body and motion of the earth, and the earth upon them, but that Mercury, Venus, Mars, Jupiter, and Saturn also, by their attractive powers, have a considerable influence upon its motion, as in the same manner the corresponding attractive power of the earth hath a considerable influence upon every one of their motions also. The second supposition is this, that all bodies whatsoever, that are put into a direct and simple motion, will so continue to move forward in a straight line, till they are, by some other effectual powers, deflected and bent into a motion describing a circle, ellipsis, or some other more compound curve line. The third supposition is, that those attractive powers are so much the more powerful in operating, by how much the nearer the body wrought upon is to their own centres. *Now what these several degrees are I have not yet experimentally verified;* but it is a notion which, if fully prosecuted, as it ought to be, will mightily assist the astronomers to reduce all the celestial motions to a certain rule, which I doubt will never be done true without it. He that understands the nature of the circular pendulum and circular motion will easily understand the whole ground of this principle, and will know where to find directions in nature for the true stating thereof. This I only hint at present to such as have ability and opportunity of prosecuting this inquiry, and are not wanting of industry for observing and calculating, wishing heartily such may be found, having myself many other things in hand, which I would first complete, and therefore cannot so well attend it. But this I durst promise the undertaker, that he will find all the great motions of the world to be influenced by this principle, and that the true understanding thereof will be the true perfection of astronomy."

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* Birch, Hist. R. S. vol. ii., p. 70.

Without lessening the credit due to the distinct expression of such remarkable ideas, it is proper to observe, that we find in Hooke's work no measured result. We do not allude only to the law of force, which is here entirely omitted: we have said that Hooke supposed it to be reciprocal to the square of the distance; but others before him, and among them Bouillaud,* had established the same supposition, on simple metaphysical considerations. Halley again did the same, after Hooke and Bouillaud. We have a convincing proof that Hooke arrived at this conclusion in no other way, from his saying that *he had not yet experimentally verified* the law of decrease in the attracting force; for he would not have thus expressed himself if he had discovered this law *directly*, by applying the theorems of Huygens on centrifugal forces to the observed orbits of the planets; for in this case the experiment would have been already made, and the law of the squares, thus obtained, would have needed no other verification. The generalization of the idea of gravity, and its extension to all celestial bodies, decreasing in intensity according to the distance, was formally expressed by Borelli[*] in 1666, in his work on the Satellites of Jupiter; and not only did he announce it as a general principle, but he explained very clearly how the planets may be retained and suspended in empty space round the sun, in the same manner as the satellites round their planets, by the action of a power continually and exactly balanced by the centrifugal force caused by their rotation, without having recourse either to the solid heavens of Aristotle, or to the vortices of Descartes. Borelli even endeavoured to deduce from this combination of forces the elliptical motions of the satellites, and the inequalities in their motions, which he considered as being partly produced by the secondary action of the sun; and though, from his being unacquainted both with the law of this force at different distances, and with the Theorems on Central Forces, published by Huygens six years afterwards, he was, of course, unable rigorously to establish these deductions; yet there was much merit in being the first to guess and perhaps to indicate the possibility of doing so. Newton also, we shall presently see, attributes to Borelli the honour of having first formed the idea of extending the principle of gravitation, and of applying it to the planetary motions; and Huygens renders him the same justice in his *Kosmotheoros*,[†] where he mentions these happy perceptions, immediately before speaking of the demonstrations of Newton. It is not then by any means impossible that Hooke might have been conducted to the same thoughts by similar, that is by purely physical considerations; and we shall presently see reasons that render this conjecture extremely probable. However, in whatever manner he formed these opinions, it is clear that in 1679 he considered them as undoubtedly correct; for, in writing to Newton on the motion of projectiles, he represents the eccentric ellipse as the consequence of a force reciprocal to the squares of the distances from the centre of the earth. This remarkable relation could not fail of striking a mind which had so long and so constantly studied the motions of the heavens. Newton, as we have already said, hastened to examine this result, by means of mathematical calculations, and discovered its truth; that is to say, he found that an attractive force, emanating from a centre, and acting reciprocally to the squares of the distances, necessarily compels the body on which it acts, to describe an ellipse, or in general a conic section, in one of whose foci the centre of force resides. The motions produced by such force exactly resemble the planetary motions, both in regard to the form of the orbit and the velocity of the body at each point. This was evidently the secret of the system of the world; but it still remained to account for the singular discordance which the moon's motion had offered to Newton, when, in 1665, he had wished to extend to her the earth's gravity diminished according to this law. Hence it was that, notwithstanding his inference was confirmed by other inductions, he abstained from publishing any thing upon the subject. Three years afterwards, however, (in June, 1682,) Newton being present at a meeting of the Royal Society, in London, the conversation turned on a new measurement of a terrestrial degree, recently executed in France, by Picard, and much credit was given to the care taken in rendering it exact. Newton, having noted down the length of the degree obtained by Picard, returned home immediately, and taking up his former calculation of 1665, began to recompute it from the new data. Finding, as he advanced, the manifest tendency of these numbers to produce the long wished for results, he suffered so much nervous excitement, that becoming at length unable to go on with the calculation, he entreated one of his friends to complete it for him. This time the agreement of the computed with the observed result was no longer doubtful. The force of gravity at the earth s surface, as determined by experiments on falling bodies, when applied to the moon, after being diminished proportionally to the square of the distance from the centre of the earth, was found to be very nearly equal to the centrifugal force in the moon, as concluded from its distance and angular velocity obtained by observation. The small difference which still existed between the two results, was in itself a new proof of exactness; for if we suppose an attractive power to emanate from all the celestial bodies inversely proportional to the squares of

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* London, 4to. 1674.

* Bullialdus, *Astronomia Philolaica.*

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[*] *Theoricæ mediceorum planetarum ex causis physicis deductæ.* (Firenze, 1666.) This same Borelli was the author of the celebrated work *de Motu Animalium.*

[†] Vid. lib. ii, p. 141. *Christiani Hugenii Kosmotheoros, sive de terris cœlestibus, eorumque ornatu conjecturæ.* (4to. Hagæ Comm. 1698.)

their distances from the bodies which they attract, the motion of the moon ought not only to depend upon its gravity towards the earth, but also to be influenced by the action of the sun; for this effect, though exceedingly weakened by the distance, ought not to be wholly imperceptible in the result.

Thus Newton ceased to doubt; and after having been, during so many years, kept in suspense about this eminently important law, he had no sooner recognized its truth, than he penetrated instantly to its most remote consequences, pursued them all with a vigour, a perseverance, and a boldness of thought, which, till that time, had never been displayed in science. Indeed it seems hardly probable that it will, at any future time, be the destiny of another human being to demonstrate such wonderful truths as these; that all the parts of matter gravitate towards one another, with a force directly proportional to their masses, and reciprocally proportional to the squares of their mutual distances; that this force retains the planets and the comets round the sun, and each system of satellites around their primary planets; and that, by the universally communicated influence which it establishes between the material particles of all these bodies, it determines the nature of their orbits, the forms of their masses, the oscillations in the fluids which cover them, and, in fine, their smallest movements, either in space or in rotation upon their own axes, and all conformably to the actually observed laws. The finding of the relative masses of the different planets, the determination of the ratio of the axes of the earth, the pointing out the cause of the precession of the equinoxes, and the discovery of the force exercised by the sun and the moon in causing the tides, were the sublime objects which unfolded themselves to the meditations of Newton, after he had discovered the fundamental law of the system of the universe. Can we wonder at his having been so much excited as not to have been able to complete the calculation which was leading him to a conviction that the discovery was achieved?

It was now that he must have experienced intense satisfaction at having so profoundly studied the manner in which physical forces act, and at having sought by so many experiments to comprehend, and exactly to measure their different effects. More particularly must he have been delighted at having created that new calculus, by means of which he was enabled to develope the most complicated phenomena, to bring to light the simple elements of motion, and thus to obtain the forces themselves from which the phenomena result; and finally, to re-descend from these forces to the detail of all their effects: for, with equal talent, had he not possessed this instrument of investigation, the complete unfolding of his discovery would have been impossible. But, possessing the means, he had only to apply them; and thus he saw the constant object of his hope attained. Henceforward, he devoted himself entirely to the enjoyment of these delightful contemplations; and during the two years that he spent in preparing and developing his immortal work, *Philosophiæ naturalis Principia Mathematica*, he lived only to calculate and to think. Oftentimes lost in the contemplation of these grand objects, he acted unconsciously: his thoughts appearing to preserve no connexion with the ordinary concerns of life. It is said, that, frequently on rising in the morning, he would sit down on his bedside, arrested by some new conception, and would remain for hours together, engaged in tracing it out, without dressing himself. He would even have neglected to take sufficient nourishment, had he not been reminded by others of the time of his meals.[*]

It was only by the uninterrupted efforts of solitary and profound meditation, that even Newton was able to unfold all the truths he had conceived, and which were but so many deductions from his great discovery. We may learn from his example, on what severe conditions even the most perfect intellect is able to penetrate deeply into the secrets of nature, and to enlarge the bounds of human attainments. For himself, he well knew, and willingly confessed, the inevitable necessity of perseverance and

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[*] The following anecdote is told on this subject. Dr. Stukely, an intimate friend of Newton, called upon him one day when his dinner was already served up, but before he had appeared in the dining-room. Dr. Stukely having waited some time, and becoming impatient, at length removed the cover from a chicken, which he presently ate, putting the bones back into the dish and replacing the cover. After a short interval, Newton came into the room, and after the usual compliments, sat down to dinner, but on taking up the cover, and seeing only the bones of the bird left, he observed with some little surprise, "I thought I had not dined, but I now find that I have."

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constancy in the exercise of his attention, in order to develope the power of thought. To one who had asked him on some occasion, by what means he had arrived at his discoveries, he replied, "By always thinking unto them;" and at another time he thus expressed his method of proceeding. "I keep the subject constantly before me, and wait till the first dawnings open slowly by little and little into a full and clear light." Again, in a letter to Dr. Bentley, he says, "If I have done the public any service this way, it is due to nothing but industry and patient thought." With such tastes and habits, the complete command of his own time, and of his own ideas, was his highest enjoyment. Thus, notwithstanding the importance of the results he had obtained, Newton was not eager to establish a title to them by publication, and perhaps he would have even longer delayed giving them to the world had an accidental circumstance not induced him to do so. About the beginning of 1684, Halley, one of the greatest of the English astronomers, and, at the same time, one of the most enlightened and active minds that have ever cultivated science, formed the idea of employing the *Theorems of Huygens on central forces*, to determine the tendency in the different planets to recede from the sun, by virtue of their revolutions about that body, their orbits being considered as circular. From the ratios discovered by Kepler between the times of these revolutions, and the major axes of the orbits, he recognized these tendencies to be reciprocally as the square of the distances of each planet from the sun, so that the attraction which this luminary exerts to keep them in their places, must also vary according to the same law. This was precisely the idea that Newton had conceived in 1666, and from which he had drawn the same consequence. But there was yet a long way from this, to the rigorous calculation of curvilinear motions when the law of the force is given. Halley perceived the difficulty of this step, and after having in vain endeavoured to remove it, he consulted Hooke, at Sir Christopher Wren's house, without, however, receiving any light on the subject, although Hooke had boasted before them both that he had completely resolved this grand question. At last, impatient to see an idea unfolded, which appeared to him so fertile in consequences, Halley went to Cambridge in 1692, purposely to confer with Newton on the subject. It was then that Newton showed to him a Treatise on Motion, in which Halley found the desired solution. This treatise, with some additions, afterwards formed the two first books of the Principia. It would appear that, at this time, Newton had already introduced, and explained some parts of it, in his lectures at Cambridge. Halley, delighted at seeing his hopes realized, requested Newton to confide to him a copy for insertion in the registers of the Royal Society, in order to secure to him the honour of so important a discovery. Although Newton had an extreme repugnance to expose himself in the arena of literary intrigue, where he had, on a former occasion, wasted his time, and sacrificed his tranquillity, Halley, by repeated entreaties, at length succeeded in his object. On returning to London, Halley announced his success to the Royal Society, who repeated the request by means of Aston, at that time their secretary. But, though Newton kept his word to Halley, personally, by sending him a copy of his treatise, he did not then wish it to be communicated, having still many things to complete.* It was not till the following year, that Dr. Vincent presented, in Newton's name, this work, which was destined to make so great a revolution in science. Newton dedicated it to the Royal Society, who showed itself able to appreciate such an honour. It decided that the work should be printed immediately at its own expense, and addressed to the author, by Halley, a letter of thanks expressed in the most honourable terms.

Hooke, who probably had for some time past conceived in his mind similar ideas, without having been able to bring them to perfection, had no sooner understood the object of Newton's treatise, and heard of the admiration with which it was received, than he claimed for himself the priority of the discovery of the law of attraction varying inversely as the square of the distance. His reclamation was so violent, that Halley thought it necessary to notice it in his official letter to Newton, and to say that Hooke expected Newton to mention in his preface, that the priority was due to him. We will here quote the answer of

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* Birch, Hist. R. S. vol. iv. p. 370.

Newton*, (dated Cambridge, 26th June, 1686,) especially as it will enable us to trace more clearly the progress and developement of his ideas throughout this important research.

"In order to let you know the case between Mr. Hooke and me, I give you an account of what passed between us in our letters, so far as I could remember; for 'tis long since they were writ, and I do not know that I have seen them since. I am almost confident by circumstances, that Sir Christopher Wren knew the duplicate proportion when I gave him a visit; and then Mr. Hooke, by his book Cometa, written afterwards (1678), will prove the last of us three that knew it. I intended in this letter to let you understand the case fully, but it being a frivolous business, I shall content myself to give you the heads of it in short, viz. that I never extended the duplicate proportion lower than to the superficies of the earth, and before a certain demonstration I found the last year, have suspected it not to reach accurately enough down so low; and therefore in the doctrine of projectiles never used it, nor considered the motion of the heavens, and consequently Mr. Hooke could not, from my letters, which were about projectiles, and the regions descending hence to the centre, conclude me ignorant of the theory of the heavens. That what he told me of the duplicate proportion was erroneous, namely, that it reaches down from hence to the centre of the earth—that it is not candid to require me now to confess myself in print then ignorant of the duplicate proportion in the heavens, for no other reason but because he had told it me in the case of projectiles, and so upon mistaken grounds accused me of that ignorance;—that, in my answer to his first letter, I refused his correspondence; told him I had laid philosophy aside, sent him only the experiment of projectiles (rather shortly hinted, than carefully described) in compliment, to sweeten my answer, expected to hear no further from him, could scarce persuade myself to answer his second letter, did not answer his third, was upon other things, thought no further of philosophical matters than his letters put me upon it, and therefore may be allowed not to have had my thoughts about me so well at that time. That, by the same reason, he concluded me ignorant of the rest of that theory I had read before in his books. That, in one of my papers, writ (I cannot say what year, but I am sure some time before I had any correspondence with Mr. Oldenburg, and that's above fifteen years ago) the proportion of the forces of the planets to the sun reciprocally duplicate to their distances from him, and the proportion of our gravity to the moon's *conatus recedendi a centro terræ* is calculated, though not accurately enough.—That, when Huygenius put out his treatise de Horologio Oscillatorio, a copy being presented to me, in my letter of thanks to him I gave those rules in the end thereof a particular commendation for their usefulness in computing the forces of the moon from the earth, and the earth from the sun, in determining a problem about the moon's phase, and putting a limit to the parallax, which shews that I had then my eye upon the forces of the planets arising from their circular motion, and understood it; so that a while after, when Mr. Hooke propounded the problem solemnly in the end of his *Attempt to prove the motion of the earth*, if I had not known the duplicate proportion before, I could not but have found it now. Between ten and eleven years ago, there is an hypothesis of mine registered in your books, wherein I hinted a cause of gravity towards the earth, sun, and planets, with the dependence of the celestial motions thereon; in which the proportion of the decrease of gravity from the superficies of the planet (though for brevity sake not there expressed) can be no other than reciprocally duplicate of the distance from the centre; and I hope I shall not be urged to declare in print that I understood not the obvious mathematical conditions of my own hypothesis; but grant I received it afterwards from Mr. Hooke, yet have I as great a right to it as to the ellipsis. For as Kepler knew the orb to be not circular but oval, I guessed it to be elliptical; so Mr. Hooke, without knowing what I have found out since his letters to me, can know no more but that the proportion was duplicate *quam proxime* at great distances from the centre, and only *guessed* it to be so accurately, and guessed amiss in extending that proportion down to the very centre; whereas Kepler guessed right at the ellipsis, and so Hooke found less of the proportion than Kepler did of the ellipse, there is so strong an objection against the accurateness of this proportion, that without my demonstrations, to which Hooke is yet a stranger, it cannot be believed by a judicious philosopher to be anywhere accurate. And so, in stating this business, I do pretend to have done for the proportion as for the ellipse, and to have as much right to the one from Hooke and all men, as to the other from Kepler, and, therefore, on this account also, he must, at least, moderate his pretences. The proof you sent me I like very well: I designed the whole to consist of three books; the second was finished last summer, being short, and only wants transcribing, and drawing the cuts fairly. Some new proportions I have since thought of, which I can as well let alone. The third wants the theory of comets. In autumn last, I spent two months in calculations to no purpose, for want of a good method, which made me afterwards return to the first book, and enlarge it with divers propositions, some relating to comets, others to other things found out last winter. The third I now design to suppress. Philosophy is such an impertinently litigious lady, that a man had as good be engaged in lawsuits, as have to do with her. I found it so formerly, and now I am no sooner come near her again, but she gives me warning. The two first books, without the third, will not bear so well the title of *Philosophiœ Naturalis Principia Mathematica*; and, therefore, I had altered it to this, *De Motû corporum libri duo*; but, upon second thoughts, I retain the former title, 'twill help the sale of the book, which I ought not to diminish now 'tis yours."

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* This latter is printed in the Biographia Brittannica.—Art. Hooke.

Newton then adds, in a postscript, " Sinee my writing this letter, I am told by one who had it from another lately present at one of your meetings, how that Mr. Hooke should make a great stir, pretending I had all from him, and desiring they would see that he had justice done him. This carriage towards me is very strange and undeserved; so that I cannot forbear in stating the point of justice, to tell you further that he has published Borelli's hypothesis in his own name; and the asserting of this to himself, and completing it as his own, seems to me the ground of all the stir he makes. Borelli did something and wrote modestly. He has done nothing, and yet written in such a way, as if he knew, and had sufficiently hinted all but what remained to be determined by the drudgery of calculations and observations, excusing himself from that labour, by reason of his other business; whereas he should rather have excused himself by reason of his inability—for it is very plain, by his words, he knew not how to go about it. Now is not this very fine? Mathematicians that find out, settle, and do all the business, must content themselves with being nothing but dry calculators and drudges; and another that does nothing but pretend and grasp at all things, must carry away all the invention, as well of those that were to follow him, as those that went before. Much after the same manner were his letters writ to me, telling me that gravity in descent from hence to the centre of the earth was reciprocally in a duplicate ratio of the altitude—that the figure described by projectiles in that region would be an ellipsis, and that all the motions of the heavens were thus to be accounted for; and this he did in such a way, as if he had found out all, and knew it most certainly. And upon this information, I must now acknowledge, in print, I had all from him, and so did nothing myself but drudge in calculating, demonstrating, and writing upon the inventions of this great man; and yet, after all, the first of these three things he told me is false, and very unphilosophical; the second is as false; and the third was more than he knew, or could affirm me ignorant of, by anything that passed between us in our letters. Nor do I understand by what right he claims it as his own; for as Borelli wrote long before him, that, by a tendency of the planets towards the sun, like that of gravity or magnetism, the planets would move in ellipses: so Bullialdus wrote, that all force respecting the sun as its centre, and depending upon matter, must be in a reciprocally duplicate ratio of the distance from the centre, and used that very argument for it, by which you, Sir, in the last Transactions, have proved this ratio in gravity."

The remainder of this letter offering no other historical details, we will not continue the quotation; but the extremely curious reply of Halley to Newton is well worthy of attention. It is dated 29th June, 1686. Halley begins by encouraging Newton not to heed the effects of Hooke's expostulations with the Royal Society, and then continues, "According to your desire, I waited upon Sir C. Wren, to inquire of him, if he had the first notion of the reciprocal duplicate proportion from Mr. Hooke? his answer was, that he himself, very many years since, had had his thoughts upon making out the planet's motions by a composition of a descent towards the sun and an impressed motion; but that at length he gave over, not finding the means of doing it. Since which time Mr. Hooke had frequently told him that he had done it, and attempted to make it out to him, but that he never was satisfied that his demonstrations were cogent. And this I know to be true, that in January, 168¾, I having, from the sesquialterate proportion of Kepler, concluded that the centripetal force decreased in the proportion of the squares of the distance reciprocally, came on Wednesday to town, from Islington, where I met with Sir C. Wren and Mr. Hooke, and falling in discourse about it, Mr. Hooke affirmed, that upon that principle all the laws of the celestial motions were to be demonstrated, and that he himself had done it. I declared the ill success of my attempts; and Sir Christopher, to encourage the inquiry, said, that he would give Mr. Hooke, or me, two months time to bring him a convincing demonstration thereof; and besides the honour, he of us that did it should have from him a present of a book of forty shillings. Mr. Hooke then said he had it, but that he would conceal it for some time, that others, trying and failing, might know how to value it, when he should make it public. However, I remember that Sir Christopher Wren was little satisfied that he could do it; and though Mr. Hooke then promised to show it to him, I do not find that, in that particular, he has been so good as his word. The August following, when I did myself the honour to visit you, I then learned the good news, that you had brought this demonstration to perfection, and you were pleased to promise me a copy thereof, which I received with great satisfaction; and thereupon took another journey to Cambridge, on purpose to confer with you about it, since which time it has been entered upon the register-books of the society. Mr. Hooke, according to the philosophically ambitious temper he is of, would, had he been master of a like demonstration, no longer have concealed it, the reason he told Sir Christopher and me now ceasing. But now he says that it is but one small part of an excellent system of nature, which he has conceived but has not yet completely made out; so that he thinks not fit to publish one part without the other. But I have plainly told him, unless he produce another differing demonstration, and let the world judge of it, neither I nor any one else can believe it. After the meeting of the Royal Society, at which your book was presented, being adjourned to the Coffee-house, Mr. Hooke did there endeavour to gain belief, that he had some such things by him, and that he gave you the first hint of this invention; but I found they were all of opinion that nothing thereof appearing in print, nor on the books of the Society, you ought to be considered as the inventor. And if in truth he knew it before you, he ought not to blame any one but himself, for having taken no more care to secure a discovery which he puts so much value on." Halley concludes, by conjuring Newton, in the name of science, not to suppress the third volume through disgust at the conduct of an envious rival. Happily he succeeded, and Newton has, in a scholium,* generously mentioned Wren, Hooke, and Halley, as having all three recognized in the celestial motions the existence of an attraction reciprocally proportional to the square of the distance.

Newton's *Principia* appeared complete in 1687. We may form some idea of the novelty and profundity of the discoveries which it contained, on learning that, when it was first published, not more than two or three among Newton's contemporaries were capable of understanding it; that Huygens himself, a man whose mind was particularly suited to appreciate its merit, only in part adopted the idea of gravitation, and that merely as regarded the heavenly bodies, while he rejected its influence between the separate particles of matter—being preoccupied by the hypothetical ideas he had formed respecting the cause of gravity; that Leibnitz, perhaps through rivalry, or perhaps by a prepossession in favour of his own metaphysical system, completely mistook the beauty and the certainty of the method employed by Newton in this work, and even went so far as to publish a dissertation, in which he endeavoured to demonstrate the same truths on different principles;

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* Book 1, Prop. 4.

that even many years after the publication of the Principia, several most profound mathematicians (John Bernoulli, for instance) opposed it, and that Fontenelle, though in advance of his age on most subjects of philosophy, expressed somewhat more than doubts concerning the law of attraction, and persisted, during his whole life, in upholding the vortices of Descartes; and in fine, that more than fifty years elapsed before the great physical truth contained and demonstrated in the Principia was, we do not say followed up and developed, but even *understood* by the generality of learned men. Whatever difficulty, however, the just appreciation of such a work may present, we can here give a brief account of it with entire confidence, by translating the words of that illustrious man, whose genius has so much contributed to Newton's glory, in having by his own discoveries subjected *all* the movements of the celestial bodies to the law of universal gravitation. After having exhibited him as setting out from the laws of Kepler, in order to discover the nature and the law of the force that governs the motions of the planets and the satellites in their orbits, and afterwards generalizing this idea according to the phenomena that presented themselves until he had ascended to the certain and mathematical knowledge of universal gravitation, "Newton," says LAPLACE,* "having arrived at this point, saw all the great phenomena of the universe flow from the principle he had discovered. By considering gravity at the surface of the heavenly bodies as the result of the attractions of all their particles, he discovered this remarkable and characteristical property of a law of attraction reciprocal to the square of the distance, namely, that two spheres formed of concentric layers, and with densities varying according to any law whatever, attract each other mutually, as if their masses were united at their centres. Thus the bodies of the solar system act upon each other, and upon the bodies placed at their surfaces, very nearly as if they were so many centres of attraction—a result which contributes to the regularity of their movements, and which made this illustrious mathematician recognize the gravity of the earth in the force that retains the moon in her orbit. He proved that the earth's movement in rotation must have flattened it at the poles; and he determined the laws of gravitation in the degrees of the meridian, and in the force of gravity at the earth's surface. He saw that the attractions of the sun and moon excite and maintain in the ocean those oscillations which are there observed under the name of *tides*. He recognized several inequalities in the moon's motion and the retrograde motion of her nodes to be owing to the action of the sun. Afterwards, considering the excess of matter in the terrestrial spheroid at the equator, as a system of satellites adhering to its surface, he found that the combined actions of the sun and of the moon tend to cause a retrogradation, in the nodes of the circles they describe round the axis of the earth; and that the sum of these tendencies being communicated to the whole mass of the planet, ought to produce in the intersection of its equator with the ecliptic that slow retrogradation known by the name of the precession of the equinoxes. The true cause of this great phenomenon could not have even been suspected before the time of Newton, since he was the first who made known the two leading facts on which it depends. Kepler himself, urged by an active imagination to explain every thing by hypothesis, was constrained to avow in this instance the failure of his efforts. But, with the exception of the theory of the elliptical motions of the planets and comets, the attraction of spheres, the ratio of the masses of the planets accompanied by satellites to that of the sun, all the other discoveries respecting the motions and figures of the heavenly bodies were left by him in an incomplete state. His theory of the figures of the planets is limited, by supposing them to be homogeneous. His solution of the problem of the precession of the equinoxes, though very ingenious, and notwithstanding the apparent agreement of its result with observations, is defective in many particulars. Among the numerous perturbations in the motions of the heavenly bodies, he has only considered those of the moon, the greatest of which, viz. *evection*, has wholly escaped his researches. Newton has well established the existence of the principle he had the merit of discovering; but the development of its consequences and advantages has been the work of the successors of this great mathematician. The imperfection of the infinitesimal calculus when first discovered, did not allow him completely to resolve the difficult problems which the theory of the universe offers; and he was oftentimes forced to give mere hints, which were always uncertain till confirmed by rigorous analysis. Notwithstanding these unavoidable defects, the importance and the generality of his discoveries respecting the system of the universe, and the most interesting points of natural philosophy, the great number of profound and original views which have been the origin of the most brilliant discoveries of the mathematicians of the last century, which were all presented with much elegance, will insure to the Principia a lasting pre-eminence over all other productions of the human mind."

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* Exposition du Système du Monde, par Mons. le Compte LAPLACE. *Paris*, 1813. 4to. pp. 413, 426.

The great results that Newton has amassed in the Principia are almost all presented in a synthetical form, like that used in the writings of the ancients. Nevertheless we may assert, that he did not discover them by means of synthesis, which is neither sufficiently easy of application, nor sufficiently fertile in results to be employed in discovering such complicated truths, or for foreseeing consequences so remote from their first principle. It is hence evident, from this very impossibility, that Newton attained these great results by the help of analytical methods, of which he had himself so much increased the power; and this conclusion acquires certainty from the correspondence between Newton and Cotes, relating to the second edition[*] of the Principia, for in it we find Cotes, the pupil of Newton, employing the analytical form either in submitting to Newton the difficulties he met with, or in solving them himself. It remains to be explained why Newton preferred setting forth his discoveries by a different method, thus depriving himself of the increase of glory he would infallibly have obtained, by giving to the world the several analytical inventions with which he must have been acquainted in solving the questions he has treated. Among these we may mention the principle of the *calculus of variations*, which must have been necessary to him in determining the *solid of the least resistance*. It were difficult to say with certainty what decided him to make such a sacrifice, but if we may hazard a conjecture, it may not be impossible that, from the excessive apprehension which he laboured under of having his results attacked, he preferred the synthetical form, as being a severer method of demonstration, and as being likely to inspire more confidence in those who should read his work at a time when the methods of the infinitesimal analysis were still but little known; and when, from their novelty, they might appear less convincing to many of his readers. Whilst the Principia were preparing for the press, chance produced an incident that drew Newton from his studious retreat, and brought him on the theatre of public affairs. King James II. desiring to re-establish catholicism in England, and thinking fit to attack the usages and rights of the Protestants, had, among other measures, commanded[*] the University of Cambridge to confer the degree of M.A. on Francis, a Benedictine Monk, without requiring of him the oath prescribed by the statutes against the catholic religion. The University asserted its privileges; and Newton (who had shown himself one of the most ardent in encouraging resistance) was one of the delegates sent to maintain their rights before the High Commission Court. These delegates made so firm and unexpected a defence, that the king thought proper to drop the affair. It was this circumstance, perhaps, as much as the personal merit of Newton, that induced the University to elect him, the following year, as their representative to serve in the Convention Parliament, which declared the throne vacant, and called William to the crown. He sat in this parliament until its dissolution, but without acting a remarkable part. C. Montague, afterwards Earl of Halifax, was a member at the same time, and having been educated at Cambridge, was able to appreciate the merit of the genius who formed the glory of the University. Hence, when Halifax, having become Chancellor of the Exchequer, in 1696, conceived the design of a general recoinage, he demanded and obtained for Newton the honourable and lucrative employment of Warden of the Mint, which was at once an act of kindness, and a choice influenced by discernment. In fact, Newton rendered very signal service in executing the important measure which the statesman had determined on; being peculiarly fitted for the business by his singular mathematical and chemical knowledge. It appears that he had always taken great interest in chemistry; for, from the time when, as a child, he had lived with the apothecary at Grantham, till he resided at Cambridge, he had continued to occupy himself occasionally with that science. Of this we have a proof in his philosophical works, which are filled with profound chemical observations. In tracing the order of these labours, we find him, in his first researches about telescopes, in 1672, making a number of experiments on the alloys of metals, in order to discover the combinations most advantageous for optical purposes, and amassing in these essays a number of remarkable peculiarities in the constitution of bodies. Three years afterwards, the paper on the colours in thin plates affords us still more varied experiments on the combinations of different bodies, solid or liquid, with each other, and on the tendency or the repugnancy they have to unite; still later, the same subjects are treated with greater boldness and comprehensiveness in the Treatise on Optics, and particularly in the queries placed at the end of that admirable work; for what, *at that time*, could be bolder, than to assert that water must contain an inflammable principle, and that a similar one exists in the diamond?

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[*] M. Biot examined this correspondence at Cambridge.

[*] Vide Burnet, History of his Own Time, vol. i. p. 698.

Besides the natural charm a mind like Newton's must have felt, in the various astonishing and mysterious phenomena of chemistry, what additional interest must they have excited in him, when, having discovered the existence of molecular attraction, and the effects of actions exerted at small distances in the motion of light, he was led to see that similar forces, differing only in their law of decrease, or intensity, would be sufficient to produce in the ultimate particles of bodies all those phenomena of union and disunion, that constitute the science of chemistry! With these new and important phenomena, he occupied himself constantly at Cambridge; and, along with the study of chronology and history, they were the only relaxation he allowed himself when fatigued with his mathematical meditations. He had constructed a small laboratory for prosecuting such pursuits; and it would seem that, in the years immediately following the publication of the Principia, he devoted almost his whole time to them. But a disastrous accident deprived him, in an instant, of the fruits of so much labour, and lost them to science for ever.

Newton had a favourite little dog called "Diamond." One winter's morning, while attending early service, he inadvertently left this dog shut up in his room; on returning from chapel, he found that the animal, by upsetting a taper on his desk, had set fire to the papers on which he had written down his experiments; and thus he saw before him the labours of so many years reduced to ashes. It is said, that on first perceiving this great loss, he contented himself by exclaiming, "Oh, Diamond! Diamond! thou little knowest the mischief thou hast done." But the grief caused by this circumstance, grief which reflection must have augmented, instead of alleviating, injured his health, and, if we may venture to say so, for some time impaired his understanding. This incident in Newton's life, which appears to be confirmed by many collateral circumstances, is mentioned in a manuscript note of Huygens, which was communicated to M. Biot, of the French Institute, by Mr. Vanswinden, in the following letter:—

"There is among the manuscripts of the celebrated Huygens, a small journal in folio, in which he used to note down different occurrences; it is side Z., No. 8, page 112, in the catalogue of the library at Leyden: the following extract is written by Huygens himself, with whose hand-writing I am well acquainted, having had occasion to peruse several of his manuscripts and autograph letters.[*] *On the 29th May*, 1694, *a Scotchman of the name of Colin, informed me, that Isaac Newton, the celebrated mathematician, eighteen months previously, had become deranged in his mind, either from too great application to his studies, or from excessive grief at having lost, by fire, his chemical laboratory and some papers. Having made observations before the Chancellor of Cambridge,*

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[*] The Latin words used by Huygens are as follows: "1694, die 29 Maii, narravit mihi D. Colin, Scotus, celeberrimum ac rarum geometram, Isa. Newtonum, incidisse in phrenitin abhinc anno ac sex mensibus. An ex nimiâ studii assiduitate, an dolore infortunii, quod in incendio laboratorium chemicum et scripta quædam amiserat. Cum ad archiepiscopum Cant. venisset, ea locutum quæ alienationem mentis indicarent; deindè ab amicis cura ejus suscepta, domoque clausâ, remedia volenti nolenti adhibita, quibus jam sanitatem recuperavit, ut jam nunc librum suum Principiorum intelligere incipiat."

which indicated the alienation of his intellect, he was taken care of by his friends, and being confined to his house, remedies were applied, by means of which he has lately so far recovered his health as to begin to again understand his own Principia. Huygens mentioned this circumstance to Leibnitz, in a letter, dated the 8th of the following June, to which the latter replied on the twenty-third. 'I am very happy that I received information of the cure of Mr. Newton, at the same time that I first heard of his illness, which, without doubt, must have been most alarming. It is to men like Newton and yourself, Sir, that I desire health and a long life.'"

This account by Huygens is corroborated by the following extract from a MS. at Cambridge, written by Mr. Abraham de la Pryne, dated Feb. 3, 1692, in which, after mentioning the circumstance of the papers being set fire to, he says, "But when Mr. Newton came from chapel, and had seen what was done, every one thought he would have run mad, he was so troubled thereat, that he was not himself for a month after." From these details, it would appear that the mind of this great man was affected, either by excess of exertion, or through grief at seeing the result of its efforts destroyed. In truth, there is nothing extraordinary in either of these suppositions; nor ought we to be astonished that the first sentiments arising from the great affliction which befell Newton were expressed without violence, for his mind was, as it were, prostrated under their weight. But the fact of a derangement in his intellect, whatever may have been the cause, will explain how, after the publication of the Principia, in 1687, Newton, though only forty-five years old, *never more* gave to the world a *new* work in any branch of science; and why he contented himself with merely publishing those that he had composed long before this epoch, confining himself to the completion of those parts that required development. We may also remark, that even these explanations appear in every case to be taken from experiments or observations previously made; as for instance, the additions to the second edition of the Principia in 1713, the experiments on thick plates, on diffraction, and the chemical queries placed at the end of the Optics, in 1704; for Newton distinctly announces them to be taken from manuscripts which he had formerly written; and adds, that though he felt the necessity of extending, or of rendering them more perfect, yet henceforth such subjects were no longer in his way.[*] Thus it appears, that though he had recovered his health sufficiently to understand all his researches, and even, in some cases, to make additions or useful alterations (as is shown by the second edition of the Principia, for which he kept up a very active mathematical correspondence with Cotes), yet he did not wish to undertake new labours in the department of science where he had done so much, and where he was so well able to conceive what remained to do. But whether this determination were imposed on him by necessity, or merely caused by a sort of moral weariness, the result of so long and severe an exercise of thought, what Newton had already done is sufficient to place him in the first rank of discoverers in every branch of pure and applied mathematics. After having admired him as almost the creator of Natural Philosophy, as one of the chief promoters of mathematical analysis, we must acknowledge, also, that to him we owe the first idea of mechanical chemistry; since he regarded its combinations as the result of molecular action, and by the boldest and most felicitous inductions raised himself to a conception of the composition and variation in the state of bodies, such as before his time was unknown and unthought of. Uniting so much theoretical and experimental knowledge, Newton must have been of the greatest service in superintending the melting down of the old coinage, which, from its worn and depreciated state, it was necessary to call in; and we find, accordingly, that in three years time (1699) he was recompensed for his services by the lucrative appointment of *Master of the Mint.* Hitherto, his means had been small[†] for his domestic wants. This new accession of fortune, however, did not render him unworthy of it; having gained it by merit, he maintained his title to it by the use he made of it. At this time, all the clouds had disappeared with which the spirit of jealousy had endeavoured to obscure his glory. He had raised himself too high to have a rival remaining, and due homage was paid from all quarters to his transcendent talents.

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[*] Vide Optics, end of second book.

[†] The estates of Woolsthorpe and Sustern were valued, at that period, at about 80l. per annum. He derived, also, some revenue from the university and from Trinity College.—Vide *Turner.*

In 1699, the Académie des Sciences at Paris being empowered by a new Royal Charter to admit a very small number of foreign associates, hastened to make this distinction yet more honourable by enrolling on its lists the name of Newton. In 1701, the University of Cambridge again elected him to serve in Parliament.

In 1703, he was chosen President of the Royal Society of London, a title which renders the person on whom it is conferred, as it were, the public representative of philosophy and science, and gives to him an influence the more useful, because it proceeds from voluntary confidence. Newton was annually reelected to this honourable office, and continued to fill it during the remainder of his life (a period of twenty-five years); and finally, in 1705, he was knighted by Queen Anne. He now determined to publish himself, or to allow others to publish, his different works. He first gave to the world his Optics, a treatise which comprises all his researches on light. It would appear that, fatigued with the petty attacks that his ideas on these subjects had drawn upon him (in 1672-5), Newton had resolved not to publish this work during the life of Hooke; the latter, however, died in 1702, and the jealous influence he had been able to exercise had previously expired. Newton, having no longer any fear of controversy, did not delay publishing these discoveries, which, though of a different description, and of a less general application than those which the world had admired in the Principia, are not inferior to them in the originality of their conception.

When the Optics appeared, in 1704, it was written in English. Dr. Samuel Clarke, afterwards so celebrated for his controversies with Leibnitz, published a Latin version in 1706, with which Newton was so satisfied, that he presented the translator with 500*l.* as a testimony of his acknowledgment; many editions of the work itself, and of the translation, rapidly succeeded each other, both in England and on the continent. Although the number of editions shows how much this treatise has from that time been admired, yet its whole merit has not been fully appreciated till within these few years, when new discoveries, and particularly that of the polarization of light, have rendered perceptible all the importance of certain very delicate phenomena, whose general existence Newton had pointed out in the propagation of light, and which, under the names of "fits of easy transmission and reflection," he considered as essential attributes of that principle. These properties being so subtile, that they escape all observations which are not extremely exact, and being at the same time so singular that, in order to admit them, it is necessary to have the fullest conviction of the accuracy of the experiments which establish them, they were, for a long period, regarded merely as ingenious hypotheses; and it has even been thought in some degree necessary to apologize for Newton's having mentioned them. But, in the present day, it is generally acknowledged that these properties, with the laws assigned to them by Newton, are modifications really and incontestably inherent in light, though their existence must be differently conceived and applied, according to the hypothesis we adopt as to the nature of the luminous principle.

To the first edition of the *Optics*, Newton added two analytical treatises, the one entitled "*Enumeratio linearum tertii ordinis*," and the other, "*Tractatus de quadratura curvarum*." The latter contains an explanation of the method of fluxions, and its application to the quadrature of curves, by means of expansion into infinite series; and the first a very elegant classification of curves of the third order, with a clear and rapid enumeration of their properties, which Newton probably had discovered by the method of expansion, enunciated in the former treatise; though he merely indicates the results, without mentioning the process which he had employed in investigating them. These two treatises were withdrawn from the following editions of the *Optics*, with the subject of which they were not sufficiently connected; but we may presume that Newton's object in inserting them in the edition of 1704 was to insure his right to the discovery and application of those new analytical methods, which, after having been so long in his secret, and as he supposed, sole possession, had now for several years been making their way with much success on the continent, and were then producing new and important results in the hands of foreign analysts, particularly of Leibnitz, and the Bernoullis.

The great renown which Newton had acquired, caused all his productions to be received with avidity. Hence it was that Whiston published in 1707, without the knowledge or consent of Newton, the "*Arithmetica universalis*," which appears to have been merely the text of the lectures on Algebra, that he delivered at Cambridge, written rapidly for his own use, and not intended for publication. Science, however, must congratulate itself on the transgression of confidence that has fortunately made this work known; for it were impossisible to see a more perfect model of the art by which geometrical or numerical questions may be submitted to algebraical calculation; whether we regard the happy choice of the unknown quantities, or the ingenious combination of analytical formulæ, employed in finding the simplest method of solution. A second and more complete edition was published in London in 1712, according to Gravesande, with the participation of Newton himself—a proof that this production of his youth appeared to him neither unworthy of his name nor of his attention.

It was also, by the care of some other editor, but with his consent, that in 1711 a small treatise, entitled "*Methodus differentialis*," was published, in which he shows how to draw a *parabolic curve* through any given number of points—a determination which, when reduced into formulæ, is very useful in the interpolation of series, and in approximating to the quadratures of curves.

In the same year, by other hands, was published the long-suppressed treatise, "*Analysis per equationes numero terminorum infinitas*," which he had composed in 1665, and in which, as we have already said, he had explained his first discoveries in fluxions, and in expansions, by means of infinite series. A copy of this dissertation had formerly been taken by Collins, from the original sent to him by Barrow; and having been found among his papers after his death, leave was obtained from Newton to publish it—a permission which he probably gave the more willingly, as the work being of old date, incontestably established his claims to the invention of the new method.

Newton formerly had prepared, on the same subject, a more extensive treatise, entitled "*A method of Fluxions*," which he proposed to join as an introduction to a treatise on algebra, by Kinckhuysen, of which he had undertaken to publish an edition in 1672: this, without doubt, would have been more valuable than the book itself, but his fear of scientific quarrels induced him then to keep his manuscript secret. Towards the close of his life, he again thought of publishing it, but it was not printed till after his death. The same apprehension had, as we have already said, prevented him from publishing his "Optical Lectures" delivered at Cambridge. Happily, however, he had entrusted copies to many persons, and among others, to Gregory, professor of astronomy at Oxford, one of which being printed three years after his death, has preserved to us this work. It presents a very detailed experimental exposition of the phenomena of the composition and decomposition of light, with their most usual applications: it is, in fact, the *Optics* without the most difficult part, viz. the theory of colours produced by thin plates; but, in the other parts, fully developed both by calculations and by numerous experiments. In this form, it was extremely proper for the use to which Newton intended it, and at this day it offers a most valuable model for an elementary exposition of phenomena by experiment.

Here would terminate our account of the works on which the fame of Newton reposes, had not a new literary dispute (about 1712), which, in fact, he did not provoke, and the existence of which, perhaps, he more than once regretted, completely revealed all the fertility of his wonderful genius, and assembled a multitude of analytical discoveries, which we find in the correspondence that ensued. We have seen that Newton, for a long time, obstinately guarded the secret of his discoveries, and particularly that of the method of fluxions, of which he justly foresaw the future utility in calculating the phenomena of nature. However, in 1676, Leibnitz having heard of the new results that Newton was said to have obtained by means of infinite series, testified to Oldenburg the desire he felt to become acquainted with them. The latter induced Newton not to refuse a communication which could not but be honourable to him. In consequence (23rd of June, 1676), Newton sent to Oldenburg a letter to be transmitted to Leibnitz, in which he gave expressions for the expansion in series of binomial powers, of the sine in terms of the arc, of the arc in terms of its sine, and of elliptical, circular, and hyperbolic functions, without, however, any demonstration or indication of the means he had used for obtaining these results; merely stating that he possessed a method by which, when these series were given, he could obtain the quadratures of the curves from which they were derived, as well as the surfaces and centres of gravity of the solids formed by their rotation. This may in fact be done by considering each term of these series as the ordinate of a particular curve, and by then applying the method previously given by Mercator, for squaring curves, of which the ordinates are expressed rationally in terms of the abscissa. This is precisely what Leibnitz remarked in his answer to Newton on the 27th of the following August, adding that he should be glad to know the demonstration of the theorems on which Newton founded his method of reducing into series; but that, for himself, though he recognized the utility of this method, he employed another, which consisted in decomposing the given curve into its superficial elements, and in transforming these infinitely small elements into others, equivalent to them, but belonging to a curve whose ordinate was expressed rationally in terms of the abscissa, so that the method of Mercator might be applied in squaring it. After giving different explanations of this method, he declares in express terms that he does not believe that "all problems, except those of Diophantes, can be resolved by it alone, or by series," as Newton had affirmed in his letter; and among the problems which elude these processes, he mentions the case of finding curves from their tangents; adding that he had already treated many questions of this sort by means of a direct analysis, and that the most difficult had been thus solved. This was more than enough to show Newton that Leibnitz was at least upon the track of the infinitesimal calculus, if he did not possess it already; and, therefore, in his answer (dated Oct. 24th, though apparently delivered to Leibnitz much later), after giving the explanations requested by Leibnitz on the formation of binomial series, and after stating to him the succession of ideas, by means of which he had discovered them, Newton hastens to declare that he possesses for drawing tangents to curves a method equally applicable to equations, whether disengaged or not of radical quantities; "but," he adds, "as I cannot push further the explication of this method, I have concealed the principle in this anagram."[*]

He announced that he had established on this foundation many theorems for simplifying the quadrature of curves, and gave expressions for the areas in terms of the ordinates in several simple cases; but he enveloped both the method and the principle on which it rested in another anagram, more complicated than the first.

The evident object of Newton, in this letter, was to place his claims to priority of invention in the hands of Leibnitz himself. The noble frankness of Leibnitz appears on this occasion to the greatest advantage: for in his answer to Newton (21st of June, 1677) he employs neither anagram nor evasion, but details simply and openly the method of the infinitesimal calculus, with the differential notation, the rules of differentiation, the formation of differential equations, and the applications of these processes to various questions in analysis and geometry; and, what mathematicians will consider as far from being unimportant, the figures employed in the exposition of these methods offer precisely the same letters, and the same method of notation, that Leibnitz had used in his first letter of the 14th of April the preceding year. Newton made no reply to this memorable letter, either because he no longer felt the wish, or because, from Oldenburg's death, (which happened in the autumn of the same year,) he had no longer an opportunity of doing so.

Leibnitz published his differential method in the Leipzig Acts for 1684, in a form exactly similar to that which he had sent to Newton. No claim was set up at that time to contest his right of discovery, and Newton himself, *three years afterwards*, eternalized that right by recognizing it in the Principia, in the following terms.[†] "In a correspondence which took place about ten years ago, between that very celebrated mathematician G. Leibnitz and myself, I mentioned to him that I possessed a method (which I concealed in an anagram) for determining maxima and minima, for drawing tangents, and for similar operations, which was equally applicable both to rational and irrational quantities: that illustrious man replied that he also had fallen on a method of the same kind (*se quoque in ejusmodi methodum incidisse*), and communicated to me his method, which scarcely differed from mine, except in the notation and the idea of the generation of quantities."

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[*] The letters composing the anagram formed the following sentence—*datâ equatione quotcunque fluentes quantitates involvente, fluxiones invenire et vice versâ.*

[†] Scholium. Prop. vii. Lib. 2.

There is a curious ambiguity in the words, "*he replied that he had fallen on a method of the same kind*," which, to those who had not seen the letters that were interchanged, might convey the idea, that Leibnitz had discovered the key to Newton's anagram; but this meaning is not to be found in Leibnitz's letter; he only announces a supposition, honourable to his character, viz. that the concealed method of Newton has, perhaps, some connexion with that which he communicates to him. With this explanation, the above passage in the Principia is in truth a formal recognition of Leibnitz's claims. It was so considered by every one when it appeared, and during twenty years Leibnitz was allowed, without any dispute, to develope all the parts of the differential calculus, and to deduce from it an immense number of brilliant applications, which seemed to extend the power of mathematical analysis far beyond any preconceived limits. In this interval, Wallis, by publishing the above-mentioned letters between Leibnitz and Newton, only rendered, if possible, the claims of the former more complete and more incontestable in the eyes of every impartial person. It was not till 1699 that Nicholas Fatio de Duillier,* in a Memoir, in which he employed the infinitesimal calculus, claimed, in favour of Newton, the first invention of it; "and," added he, "with regard to what Mr. Leibnitz, *the second* inventor of this calculus may have *borrowed* from Newton, I refer to the judgment of those persons who have seen the letters and manuscripts relating to this business." Did Fatio really believe what he was writing, or did he wish to flatter the national pride of the country in which he lived? or was he not in some manner irritated at Leibnitz having rendered so little justice to the Principia, and at his appearing to arrogate to himself a sort of empire over all discoveries made by the aid of the new calculus? These questions we do not pretend to decide; but the two latter suppositions are the most probable. Leibnitz replied, by stating the facts, and quoting his letters, and the testimony rendered to him by Newton himself. Fatio was silent; and thus the matter stood till 1704, when Newton published the Optics. In giving an account of the *treatise on the quadratur of curves*, which was joined to this work, the editor of the Leipzig Acts naturally mentioned the evident analogy that existed between Newton's method of fluxions and the differential calculus which had been published twenty years previously by Leibnitz, in the same Acts, and which had since become the means of making an infinity of analytical discoveries. In comparing the two methods, the editor (whom Newton supposes to have been Leibnitz himself) did not precisely say, that the method of fluxions was a mere transformation of the differential calculus; but he used terms which might bear such an interpretation. This was the signal for attack, on the part of the English writers: one of the most violent of them, Keil, professor of astronomy at Oxford, said, in a paper printed in the Philosophical Transactions, not only that Newton was the first inventor of the method of fluxions, but also that Leibnitz had stolen it from him, by merely changing the name and the notation used by Newton. This produced an indignant reply from Leibnitz, who had the imprudence to submit the question to the judgment of the Royal Society, that is to say, of a tribunal which was presided over by his rival. The society, with scrupulous fidelity, collected all the original letters that could be found bearing on the matter in question, and thus, with regard to the facts, its conduct was unimpeachable; but the most important and delicate part of the business, viz. the discussion of those papers, and the consequences to be deduced by them, it referred to arbitrators chosen by itself, who were not known, and about whose appointment Leibnitz was *not* consulted. These arbitrators decided that Newton had indubitably been the first discoverer of the method of fluxions, a truth which is certainly incontestable in the sense that discovery and invention are synonimous terms; but they also added two assertions, which can only be considered as the expression of their personal opinion—first, that the *differential* and

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* A Genevese settled in England.

fluxional methods are one and the same thing; and, secondly, that Leibnitz *must* have seen a letter of Newton's, (dated 10th December, 1672,) in which the method of fluxions is described in a manner sufficiently clear for any intelligent person to understand. Now of these two assertions, the second is not proved in any one of its parts, and the letter of Newton alluded to, appears, according to his custom, to have been more intended for establishing his right, than proper for indicating the manner of attaining his method. With regard to the first assertion, that the methods are absolutely identical, it may easily be refuted by the simple consideration, that if the method of fluxions alone existed at the present moment, the invention of the differential calculus with its notation, and its principle of decomposition into infinitely small elements, would still be an admirable discovery, and one which would immediately bring to light a number of applications, which we now possess, but which probably would not have been obtainable without its assistance. Admitting then, as certain, the priority of Newton's ideas on this subject, we think that the reserve he maintained regarding it left the field open to all other inventors; and that from the general tendency of the mathematical researches of that period, both Leibnitz and Newton might have separately arrived by different means at the knowledge of a method, the want of which was then so sensibly felt in all analytical researches. The quarrel between Newton and Leibnitz has not been without advantage to mathematical science; since it produced the precious collection of letters on infinitesimal analysis, collected by the Royal Society, and published in 1712, under the name of the *Commercium Epistolicum*. But as regards these two great men themselves, the bitterness with which it inspired the one against the other, became the torment and the misfortune of the remainder of their lives. Newton went so far as to affirm, that Leibnitz had deprived him of the differential calculus, and then that this calculus was identical with Barrow's method of tangents: an assertion of which he could not but have perceived the injustice, since, if he pretended, on the one hand, that the differential calculus and the method of fluxions were the same, he must have also admitted the method of fluxions to be identical with Barrow's method of tangents, an assertion which he was far from admitting. Newton suffered himself to be carried away so far as to pretend that the paragraph inserted in the Principia, by which he had so openly acknowledged the independent rights of Leibnitz, was by no means intended to render him that testimony, but, on the contrary, to establish the priority of the method of fluxions over that of the differential calculus. Newton's animosity was not even calmed by the death of Leibnitz, in 1716: for he immediately afterwards printed two manuscript letters of Leibnitz, written in the preceding year, accompanied with a bitter refutation. Six years later, (in 1722) he caused a new edition of the Commercium Epistolicum to be printed, at the head of which he placed a very partial extract from this Collection. This was apparently made by himself, and had already appeared two years before the death of Leibnitz, in the Philosophical Transactions for 1715. Finally, Newton had the weakness to leave out, or allow to be left out, in the third edition of the Principia, published under his own inspection, 1725, the famous Scholium, in which he had admitted the rights of his rival. To render such conduct, not to say excusable, but even comprehensible, on the part of a man who must so well have known that the only tribunal that can decide on such causes is impartial posterity, it is necessary to say that Leibnitz, on his side, had neither been less passionate nor less unjust. Hurt by the unexpected publication of the Commercium Epistolicum, and irritated by a decision, given without his knowledge, by judges whom he had not appointed, and who had not waited for his defence, he summoned contrary testimonies in his support. Leibnitz had the misfortune to produce proofs equally exaggerated with those brought forward by Newton. He printed, and spread throughout Europe, an anonymous letter (since discovered to have been written by J. Bernoulli), extremely injurious to Newton, whom it represented as having fabricated his method of fluxions from the differential calculus. Leibnitz committed a still greater fault. He was in the habit of corresponding with the Princess of Wales, daughter-in law to George the First. This princess, endowed with a highly cultivated mind, had received Newton with extreme kindness, and was fond of conversing with him. She declared that she esteemed herself happy in living at a time that enabled her to become acquainted with so great a genius. Leibnitz made use of his correspondence with the princess, to lower Newton in her eyes, and to represent his philosophy to her not only as physically false, but also as dangerous in a religious point of view; and, what is still more inconceivable, he founded these accusations on passages in the *Principia*, and in the *Optics*, which Newton had evidently composed and inserted with intentions sincerely religious, and as genuine professions of his firm belief in a divine Providence. For instance, in explaining the true method to be pursued in natural philosophy, Newton says, in his Twenty-eighth Query, " the main business of this science is to argue from phenomena, without feigning hypotheses, and to deduce causes from effects, till we come to the very First Cause; which certainly is not mechanical: and not only to unfold the mechanism of the world, but chiefly to resolve these and such like questions. What is there in places almost empty of matter, and whence is it, that the sun and planets gravitate towards one another, without dense matter between them? Whence is it that nature doth nothing in vain, and whence arises all that order and beauty, which we see in the world? To what end are comets, and whence is it that planets move all one and the same way, in orbs concentric, while comets move all manner of ways in orbs very eccentric; and what hinders the fixed stars from falling upon one another? How came the bodies of animals to be contrived with so much art? and for what ends were their several parts? was the eye contrived without skill in optics, and the ear without knowledge of sounds? How do the motions of the body follow from the will, and whence is the instinct in animals? Is not the sensory of animals that place to which the sensitive substance is present; and into which the sensible species of things are carried through the nerves and brain, that there they may be perceived, by their immediate presence to that substance? And these things being rightly dispatched, does it not appear from phenomena, that there is a Being incorporeal, living, intelligent, omnipresent, who in infinite space, as it were, in his sensory, sees the things themselves intimately, and thoroughly perceives them, and comprehends them wholly by their immediate presence to himself; and which things, the images only, carried through the organs of sense into our little sensoriums, are there seen and beheld, by that which in us perceives and thinks; and though every true step made in this philosophy bring us not immediately to the knowledge of the First Cause, yet it brings us nearer to it, and on that account is to be highly valued?"

It is thus that Newton speaks of a Supreme Being; and even those who might dispute the arguments which he gives for such an existence, must still recognize, in this passage, the sentiments of a mind deeply imbued with religious feelings, and convinced of their true foundation. It was upon this ground, however, that Leibnitz attacked him in his correspondence with the princess: " it appears," says he, in one of his letters, " that natural religion is diminishing extremely in England;" and he cites as a proof the works of Locke, and the above passage from Newton; elsewhere he says, " that these principles are precisely those of the materialists." When we see a mind of the order of that of Leibnitz expressing itself with such blind contempt for the grand and incontrovertible discovery of universal gravitation, and employing such arguments in objecting to it, we are disposed to compassionate the occasional weakness of the finest intellects, and to deplore the petty passions which tarnish the splendour of genius. The rank of the person to whom this accusation was addressed increased its importance in those days. The king was informed of the matter, and expressed his expectation that Newton would reply. It would appear that it was this authority that determined Newton personally to enter the lists; but he only undertook the defence of the mathematical part of the question; the philosophical part he left to Dr. Clarke, who, though inferior as a mathematician, was a better metaphysician than himself. From this resulted a great number of letters, written by Clarke and Leibnitz to each other, which were all inspected by the princess. In the course of this correspondence, as often happens, the original question was lost amidst collateral disquisitions.* On reading these letters, it must excite surprise that a woman of rank could amuse herself with discussions of this sort, mixed up as they were with the coarse and erudite jests made use of by Leibnitz. To this taste, however, of the princess for serious matters we owe our acquaintance with a work of Newton, very different from those that we have hitherto mentioned. Conversing one day on some historical subject, Newton explained to her a system of chronology, which he had formerly composed, simply for amusement. The princess was so much pleased with it, that she requested a copy, *for her own use*, on which latter condition Newton complied with her request: he, however, gave also a copy to the Abbé Conti, who had made himself remarkable by interfering in the disputes between Leibnitz and Newton. No sooner was the Abbé in Paris, than he communicated this manuscript to the world. It was immediately translated and printed, not only without the consent or knowledge of Newton, but even accompanied with a refutation by Fréret. Newton had thus the mortification to hear at the same time of the publication and reply, without having had any suspicion of the transaction; and was hence obliged, though contrary to his original intention, at least to give a more correct edition; but he was only able to prepare one: it did not appear till after his death in 1728.

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* These letters were published in France by Desmaizeaux.

This leads us to speak of another work of Newton, which, though appearing to differ much in its title from the one we have just mentioned, is, like it, an historical memoir; the title is, "*Observations upon the Prophecies of Holy Writ, particularly the Prophecies of Daniel and the Apocalypse of St. John.*" Notwithstanding the singularity such a subject appears to offer, when treated of by a mind like that of Newton, we venture to affirm, that more persons have spoken of this dissertation than have given themselves the trouble to read it; it therefore becomes our duty here to point out more particularly the object which Newton had in view, and his manner of proceeding. The groundwork of his reasoning is concisely expressed by the following words in the work itself:*—

"The folly of interpreters hath been to foretell times and things by this prophecy, as if God designed to make them prophets. By this rashness they have not only exposed themselves, but brought the prophecy also into contempt. The design of God was much otherwise. He gave this and the prophecies of the Old Testament, not to gratify men's curiosities, by enabling them to foreknow things; but that after they were fulfilled, they might be interpreted by the event; and his own Providence, not the interpreters', be then manifested thereby to the world. Now," says Newton, "for understanding the prophecies, we are in the first place to acquaint ourselves with the figurative language of the prophets; this language is taken from the analogy between the world natural and an empire or kingdom considered as a world politic."* He then successively enters into all the details of this connexion; first of all considering the heavens and the earth as representing thrones and people; then taking the astronomical phenomena, the rain, the hail, the meteors, the animals, the vegetables, their different parts, their different actions, and those of man himself; and finally, every thing in the material world, as having a peculiar mystic signification which he fixes and defines: "for instance," says he, "when a beast or man is put for a kingdom, his parts and qualities are put for the analogous parts and qualities of the kingdom: as the head of a beast for the great men who precede and govern; the tail for the inferior people who follow and are governed; the heads, if more than one, for the number of capital parts, or dynasties or dominions in the kingdom, whether collateral or successive, with respect to the civil government; the horns on any head for the number of kingdoms in that head, with respect to military power; seeing for understanding and policy; and in matters of religion for *επισκοπει*, bishops; speaking for making laws; the mouth for a lawgiver, &c. &c."† Down to this point we find, in fact, nothing new, except the precise and, in some degree, systematic explanation of the method of interpretation: for at bottom this method is that which has been employed by all commentators; and it is really impossible to employ any other, in applying a prophecy which is not explicit in its terms. The distinguishing character of Newton's work is, that having thus made his glossary beforehand, it often suffices him for explaining a prophecy, to place the figurative terms word for word opposite to the explanations: by these means he makes a quicker and more extended progress. We will not follow him in the vast career he proposed to go over. Furnished with what he considered a key to prophetical language, he successively questions Daniel and St. John, and endeavours to produce, from their prophecies, the historical events that have taken place since their time. His work is immense; it embraces not only the principal epochs, and the most important events, in the ancient and in a part of the middle ages, but also a multitude of particular facts, of chronological observations, and of researches on civil or ecclesiastical antiquities, showing deep and extensive knowledge, taken from the most authentic sources. To give an idea of the detailed applications by which Newton has allowed himself to be carried away in this singular composition, and at the same time not to leave unnoticed the spirit of prejudice of which unhappily it bears the stamp, we will extract a passage in the seventh and eighth chapters of the first part. Newton has explained the ten horns of the fourth beast of Daniel by the ten kingdoms which the barbarians founded on the ruins of the Roman empire in the west, and has rapidly traced the history of each of these kingdoms, in order to show how it agrees with the prophecies. It remains to explain the eleventh horn of the same beast: the words of scripture are: "Now Daniel considered the horns, and behold there came up among them another horn, before whom there were three of the first horns plucked up by the roots; and behold in this horn were eyes like the eyes of a man, and a mouth speaking great things, and his look was more stout than his fellows, and the same horn made war with the saints, and prevailed against them: and one who stood by, and made Daniel know the interpretation of these things, told him, that the ten horns were ten kings that should arise, and another should arise after them and be diverse from the first, and he should subdue three kings, and speak great words against the Most High, and wear out the saints, and think to change times and laws: and that they should be given into his hands until a time and times and half a time." "Now," says Newton, "kings are put for kingdoms as above; and therefore the little horn is a little kingdom. It was a horn of the fourth beast, and rooted up three of his first horns; and therefore we are to look for it among the nations of the Latin empire, after the rise of the ten horns. But it was a kingdom of a different kind from the other ten kingdoms, having a life or soul peculiar to itself, with eyes and a mouth. By its eyes it was a seer; and by its mouth speaking great things, and changing times and laws, it was a prophet as well as a king. And such a seer, a prophet, and a king, is the church of Rome." Newton then supports this analogy by an historical account of the rise and progress of the papal power, the details of which he, in succession, compares with the prophecy. Newton carries this investigation *no further* than the last half of the eighth century, because," says he, "the Pope, by acquiring temporal power, is clearly designated by the prophet:" but carried beyond the limits previously assigned by himself to interpreters, he goes on to predict the epoch of the fall, or at least decline of this temporal power, for translating the expression of Daniel, "a time and times and half a time," by 1260 solar years, and indicating the year 800 as about the point to count from, he fixes the fatal term to be about the year 2060. We must remark, that this conclusion is not, in his work, as in those of some other protestant writers, dictated by any sectarian or party feeling; he states it with all the calm of entire conviction, and with all the simplicity of an evident demonstration. It appears to be not Newton, but St. John and Daniel, who attack the power of modern Rome, who characterize it by injurious terms, and finally predict its ruin.

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* Age of Apocalypse.

* Prophecies, part I. chap. 2.

† Prophecies, part I. chap. 2. p. 8.

It will, doubtless, be asked, how a mind of the character and force of Newton's, so habituated to the severity of mathematical considerations, so accustomed to the observation of real phenomena, so methodical, and so cautious, even at his boldest moments in physical speculation, and consequently so well aware of the conditions by which alone truth is to be discovered, could put together such a number of conjectures, without noticing the extreme improbability that is involved in all of them, from the infinite number of arbitrary postulates on which he endeavours to establish his system. The answer to this question must be taken entirely from the ideas and the habits of the age in which Newton lived. Not only was Newton profoundly religious, but his whole life was spent, and all his affections were concentrated in a circle of men, who, holding the same doctrines, consisidered themselves bound by their station or profession to defend and propagate them. The English philosophers of that period took pleasure in combining the researches of science with theological discussion; to which they were the more inclined, because the cause of protestantism had identified itself with political liberty; and men studied the bible to find weapons against despotism. The choice of Newton by the University of Cambridge as one of the delegates sent to King James, shows clearly that he shared in such sentiments; nor is it a more surprising fact, that Newton wrote upon the Apocalypse, than that R. Boyle, one of the greatest natural philosophers of the same period, published a treatise, entitled "The Christian Virtuoso," of which the object is to show that experimental philosophy conduces to a man being a good Christian,—than that Wallis, the celebrated mathematician, composed a number of tracts on religious subjects,—than that Barrow who reckoned Newton himself among his pupils, and who resigned in his favour the mathematical chair, consecrated his latter years to theology, in order to take the degree of doctor in that faculty—that Hooke, whom we have so often mentioned, composed a work on the Tower of Babel—that Whiston, Newton's pupil and successor at Cambridge, also composed an essay "on the Revelation of St. John," and other treatises on pure theology—that Clarke, another still more illustrious pupil of Newton, the faithful translator of his Optics, the zealous promoter and ingenious defender of his philosophy, was at the same time the most profound theologian and sublime preacher in England; and finally, that Leibnitz himself, to take no other example, in the course of his literary life, voluntarily made numerous excursions into the provinces of natural theology, revelation, and biblical criticism; that he commented on the story of Balaam, treated in various ways the question of grace, and with the laudable intention of uniting Protestants and Catholics, discussed with Bossuet the principal doctrinal points which separate the two churches. This alliance of the exact sciences with religious controversy, at that time so general, is the natural mode of accounting for the theological researches of Newton, however singular they might appear at the present day. There is another tract belonging to the same class of writings, which we must also mention, not only from the importance of the subject in a religious point of view, but also because it affords us a new opportunity of seeing the extensive knowledge which Newton possessed in these matters. The title is "*An historical account of two notable corruptions of the Scriptures*," in fifty pages 4to.; it contains a critical discussion of two passages in the Epistles of St. John and St. Paul, relating to the doctrine of the Trinity, which Newton supposes to have been altered by the copyists. From the nature of the subject, and from certain indications at the beginning of the pamphlet, it probably was composed when the works of Whiston and of Clarke on the same subject drew upon them the attacks of all the English theologians, that is, about 1712-13. It is certainly very remarkable that a man of the age of seventy-two or seventy-five should be able to compose rapidly, as he himself insinuates, so extensive a piece of sacred criticism, and of literary history, in which the logically connected arguments are always supported by the most varied erudition. At this period of Newton's life, the reading of religious works had become one of his most habitual occupations; and after he had performed the duties of his office, they formed, along with the conversation of his friends, his only amusement. He had now almost ceased to think of science, and as we have already remarked, since the fatal aberration of his intellect in 1693, he gave to the world only three really new scientific productions. One of these had probably been prepared some time previously, and the other must have occupied but little time: the first, published in the Philosophical Transactions, consists of only five, though very important, pages. It contains a comparative scale of temperatures, from the point of melting ice to that of the ignition of charcoal; the lower degrees are observed by means of a thermometer of linseed oil, the scale of which is divided into equal parts; the zero corresponds to the melting point of ice, and the 81st degree to the melting point of tin. The higher degrees are calculated according to the law of cooling in a metallic mass, by supposing the instantaneous decrease in temperature to be proportional to the temperature itself, and by observing the time of the arrival of the fluid at each degree of temperature intended to be marked. These two methods of observation are connected by applying them to the same temperature—for instance, to the fusion of tin, which is the highest in the one series, and the lowest in the other.

We have thus in this paper three important discoveries—first, a method of comparing thermometers, by determining the extreme terms of their scale from phenomena taking place at *constant temperatures*—secondly, the determination of the laws of cooling in solid bodies at slightly elevated temperatures; and thirdly, the observation of the constancy of temperature in the phenomena of melting and boiling—a constancy which has since become one of the foundations of the modern theory of heat: this important fact is established in Newton's treatise, by numerous and various experiments, made not only on compound bodies, and the simple metals, but on various metallic alloys, which shows us that Newton clearly perceived their importance. There is reason to believe that this paper was one of those composed before the fire in his laboratory.

The second paper we must mention, also dated 1700, was communicated by Newton to Halley, and was a plan for an instrument of reflection to observe with at sea, without the observer being disturbed by the motion of the ship. It has been pretended that this idea, since so generally and so usefully employed by navigators, had been invented a long time previously by Hooke. It is true that in the history of the Royal Society for 1666, there is mentioned an instrument proposed by Hooke, to measure angles by means of the reflection of light; this announcement, however, is unaccompanied by any description to enable us to judge of the nature of the instrument; and if we endeavour to supply this defect by consulting the works of Hooke, written after this period, we shall find, that though he often makes use of reflection, it is always when applied to *large fixed instruments*; an idea which has no relation to that of employing reflection in *moveable instruments*, in order to render the angular distance of remote objects under observation independent of small changes of place in the centre of observation from which they are viewed. There is no reason to believe that any one formed this happy and important idea before Newton, though the inexplicable silence of Halley, with regard to Newton's letter to him, left to another man, *Hadley*, the honour of again conceiving it (in 1731), and of so happily executing it, that mariners have given the name of *Hadley's Quadrant* to this ingenious and useful invention.

The last labour of Newton that remains to be mentioned, was of another sort, and composed on a totally different occasion. In 1696, J. Bernoulli proposed to the mathematicians of Europe, to discover a curve, down which a heavy body should descend in the quickest time possible, between two given points at unequal heights. Newton having received this problem, presented on the next day a solution of it, but without any demonstration, merely saying that the required curve must be a cycloid, for the determination of which he gave a method. This solution appeared anonymously in the Philosophical Transactions, but J. Bernoulli immediately guessed the author; "*tanquam*," says he, "*ex ungue Leonem*." This method of defiance, then in vogue, was again presented some years later to Newton, but by a more formidable adversary, and in a case where victory was of still more importance. In 1716, when the dispute about the invention of the infinitesimal analysis was at his height, Leibnitz wishing to show the superiority of his calculus over Newton's method of fluxions, sent, in a letter to the Abbé Conti, the enunciation of a certain problem, in which it was required to discover a curve such as should cut at right angles an infinity of curves of a given nature, but all expressible by the same equation; "he wished," he said, "to feel the pulse of the English analysts." Of course the question was a very difficult one. It is said that Newton received the problem at four in the afternoon as he was returning from the Mint, and, that though extremely fatigued with business, yet he finished the solution before retiring to rest. It has been, however, justly remarked, that Newton only gave the differential equation for the problem, and not its integral, in which the real difficulty consists. This was his last effort of the kind; and he soon entirely ceased to occupy himself with mathematics: so that during the last ten years of his life, when consulted about any passage in his works, his reply was, "Address yourself to Mr. De Moivre, he knows that better than I do." And then, when his surrounding friends testified to him the just admiration his discoveries had universally excited, he said, "I know not what the world will think of my labours, but, to myself, it seems that I have been but as a child playing on the sea-shore; now finding some pebble rather more polished, and now some shell rather more agreeably variegated than another, while the immense *ocean of truth* extended itself *unexplored* before me."*

This profound conviction of the numerous discoveries that still remained to be made, did not, however, bring him again on that sea where he had advanced so much farther than any other man. His mind, fatigued by long and painful efforts, had need of complete and entire repose. At least we know, that thenceforward he only occupied his leisure with religious studies, or sought relief in literature or in business. Newton, the greatest of mankind in science, was, if we may dare to say so, but an ordinary man in other pursuits; he never distinguished himself in parliament, to which he was twice summoned; and in one instance he appears to have acted with inexplicable timidity.† In 1713, a bill was brought in for encouraging the discovery of a method for finding the longitude at sea. Whiston, the author of the bill, and who himself tried to gain the reward proposed in it, obtained the appointment of a committee for discussing the measure; and four members of the Royal Society were invited to attend—Newton, Halley, Cotes, and Dr. Clarke: the three latter gave their opinions verbally, but Newton read his from a paper he had brought with him, without being understood by any one; he then sat down and obstinately kept silence, though much pressed to explain himself more distinctly. At last Whiston, seeing the bill was going to fail, took on himself to say, that Mr. Newton did not wish to explain more through fear of compromising himself, but that he really approved of the measure. Newton then repeated word for word what Whiston had said, and the report was brought up. This almost puerile conduct, on such an occasion, tends to confirm the fact of the aberration of Newton's intellect in 1695, though it might have been merely the effect of excessive shyness, produced by the retired and meditative habits of his life. For, to judge from a letter of Newton,* written some time before the disastrous epoch, in which he points out the conduct to be pursued by a young traveller, it would appear that he was very ignorant of the habits of society.

From the manner in which his life was spent, we may easily conceive that he was never married, and (as Fontenelle says) that he never had leisure to think about it; that being immersed in profound and continual studies during the prime of his life, and afterwards engaged in an employment of great importance, and ever quite taken up with the company which his merit drew to him, he was not sensible of any vacancy in life, nor of the want of domestic society. His niece, who with her husband lived in his house, supplied the place of children, and attended to him with filial care. From the emoluments of his office—from a wise management of his patrimony—and from his simple manner of living, Newton became very rich, and employed his wealth in doing much good. He thought, says Fontenelle, that a legacy is no gift, and therefore left no will—it was always out of his *present* fortune that he proved his generosity to his relations, or to the friends whom he knew to be in want. His physiognomy might be called calm rather than expressive, and his manner languid rather than animated: his health remained good and uniform till his eightieth year; he never used spectacles. About that age he began to suffer from an incontinence of urine; but notwithstanding this infirmity, he still had, during his five remaining years, long intervals of health, or at least of freedom from pain, obtained by a strict regimen and other precautions, which till then he had never had occasion for. He was now obliged to rely upon Mr. Conduit, who had married his niece, for the discharge of his official duties at the Mint. Newton was useful to Conduit, even after death: for the honourable confidence that existed between them gave him a sort of claim to the office, which the king eagerly confirmed.

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* This anecdote is mentioned in a manuscript of Conduit. Vid. Turner.

† This anecdote is mentioned by Whiston in his work, "Longitude Discovered,"—8vo. London, 1738.

* Biographia Britannica, p. 3242.

"Newton," says Fontenelle, "did not suffer much, except in the last twenty days of his life: it was truly judged from the symptoms, that he was afflicted with the stone, and that he could not recover. In the paroxysms of pain, he uttered not a moan, nor gave any sign of impatience; and, as soon as he had a moment of relief, he smiled and spoke with his usual gaiety. Hitherto he had always employed some hours every day in either reading or writing. On Saturday the 18th of March, he read the papers in the morning, and conversed for some time with Dr. Mead, the physician who attended him, having then the perfect use of all his senses and his understanding; but in the evening, he entirely lost them without again recovering, as if the faculties of his mind were not destined to linger by degrees, but at once to vanish. He died the Monday following (March 20th, 1727,) at the age of eighty-five. His corpse lay in state in the Jerusalem Chamber, and was thence conveyed to Westminster Abbey; the funeral ceremony was numerously attended; the pall was supported by six peers; and every honour was paid to his remains."

The family of Newton, justly sensible of the distinction derived from their connexion with so great a genius, erected at a considerable expense a monument to his memory, on which is inscribed an epitaph, ending as follows:—"*Sibi gratulentur mortales tale tantumque exstitisse humani generis decus.*"—"Let mortals congratulate themselves that so great an ornament of the human race has existed"—an eulogy which, though true in speaking of Newton, can be applied to no one else.

Besides the works we have already mentioned, Newton published an edition of the "Geographia Generalis" of Varenius, 8vo, 1672, reprinted in 1681. There is no really complete edition of the works of Newton, though Bishop Horsley published one in five volumes, 4to, to which he has given this title; but he has omitted a number of papers collected by Castillon (4 vols. 4to, Lausanne, 1744). By joining to these two books Newton's scientific letters inserted in the Biographia Britannica, we may make a tolerably complete collection of his works. Among the numerous translations that have appeared of the principal ones, we must not omit that of the Principia in French by Madame Duchâtelet, since it contains excellent notes supposed to be by Clairault. There are also two books in English, viz. H. Pemberton's "*View of Sir I. Newton's Philosophy,*" (London, 1728, 4to), and C. Maclaurin's "*Account of Sir I. Newton's Philosophical Discoveries,*" both of which will well repay the trouble of perusing them. It is, however, in the writings of the modern continental mathematicians, that we find the more complete developement of those brilliant discoveries which have shed so much lustre on the name of Newton. It is with the works of LAPLACE, Lagrange, Biôt, Lacroix, Monge, Garnier, Poisson, DELAMBRE, Boucharlat, Carnot, Bailly, Bernouilli, Euler, Bossut, Montucla, De Zach, Lalande, Francœur, Legendre, Poisson, Gauss, Hauy, &c. &c., that the student must become acquainted, before he can hope to attain to a thorough knowledge of the system of the universe. In science, it is perhaps more necessary than in any other species of knowledge intimately to understand what has been done by our predecessors; and it therefore becomes our duty to express our earnest hope, that our readers will not merely content themselves with studying the works of that great man whose discoveries we have in this treatise recorded, but that, endeavouring themselves to enter on the same illustrious career, they will diligently peruse the writings of the distinguished individuals whose names we have just mentioned. A list is given in *Hutton's* Mathematical Dictionary of the principal MSS. now in existence, that were written by Newton.

LIST

OF THE EDITIONS OF NEWTON'S WORKS.

1779-85 Works by Bp. Horsley. 5 vols. 4to. London.
1744 Opuscula Mathematica, Philosophica et Philologica cura Castillionei, 3 vols. 4to. Lausanne et Geneva.

Various pieces are to be found in:
Commercium Epistolicum Collins.
Gregory's Catoptrics.
Birch's General Dictionary.
Philosophical Transactions.
Greave's Works.
} all enumerated at length in Watt's Bibliotheca Britannica.

Analysis per Quantitatum Series, Fluxiones, et Differentias cum Enumeratione Linearum Tertii Ordinis.

(printed originally with the Optics.)

1711 Analysis, etc. London. (*Cura Jones.*)
1736 Analysis. Method of Fluctions and Infinite Series, translated by Colson. 4to. London.
1737 Analysis. Method of Fluxions and Infinite Series. 8vo. London.
1776 Analysis. Method of Fluctions and Infinite Series, by Colson. 4to.
1740 Analysis. Méthode des Fluxions, etc. par Buffon. 4to. Paris.

Newtoni Arithmetica Universalis, sive de Compositione et Resolutione Arithmetica.

1707 Arithmetica Universalis. 8vo. Londini. (*Cura Whiston.*)
1722 Arithmetica Universalis. 8vo. London.
1732 Arithmetica Universalis. 4to. Lugd. Bat. 1732. (*Cura Gravesande.*)
1761 Arithmetica Universalis cum Comment. Castillionei, 2v. 4to. Amstel.
1728 Universal Arithmetick, by Ralphson and Cann. 8vo. London.
1769 Universal Arithmetick, by Ralphson, with notes by Wilder. 2 vols. 8vo. London.
1802 Arithmetique Universelle, par N. Beaudeux, avec des Notes. 2 vols. 4to. Paris.

Chronology.

1726 Abregé de Chronologie. *See* Watt's Bibl. Brit.
1728 Chronology of Ancient Kingdoms amended. 4to. London.
1728 Chronologie, par l'Abbé Granet. 4to. London.
1745 Chronologie der Ælteren Königreiche. 8vo. Hildburghausen.

1672 Varenii Geographia. 12mo. Cantabr.
1681 Varenii Geographia. 12mo. Cantabr.
1712 Varenii Geographia. 8vo. Cantabr.
} edited by Sir I. Newton.

1687 Philosophiæ Naturalis Principia Mathematica. 4to. Londini.
1713 Philosophiæ Naturalis Principia Mathematica. 4to. Cantabr. (COTESII.)
1726 Philosophiæ Naturalis Principia Mathematica. 4to. Londini. (PEMBERTON.)
1730 Philosophiæ Naturalis Principia Mathematica. 2 vols. 8vo. Londini. (DONICK.)
1723 Philosophiæ Naturalis Principia Mathematica. 4to. Amstelodami. (COTESII.)
1765 Philosophiæ Naturalis Principia Mathematica—Excerpta, cum Notis. 4to. Cantabrigiæ.
1714 Philosophiæ Naturalis Principia Mathematica. 4to. Amstelod. (COTESII.)
1739-42 Philosophiæ Naturalis Principia Mathematica, perpetuis Commentariis Illustrata, Communi Studio. Th. Le Seur et Fr. Jacquier. 4 vols. 4to. Genevæ, 1739, 40, 42.
1760 Philosophiæ Naturalis Principia Mathematica, perpetuis Commentariis Illustrata Communi Studio. Th. Le Seur et Fr. Jacquier, 3 vols. in 4. 4to. Colon. Allobrog.

1822 Philosophiæ Naturalis Principia Mathematica, perpetuis Commentariis Illustrata, Communi Studio. Th. Le Seur et Fr. Jacquier, Editio Stereotypa. 4 vols. roy. 8vo. Glasguæ.
1729 Mathematical Principles of Natural Philosophy, translated into English by Motte, with the Laws of the Moon's Motion, according to Gravity, by J. Machin. 2 vols. 8vo. London.
1819 ———— The same. 3 vols. 8vo. London.
1777 Mathematical Principles of Natural Philosophy, by Thorpe. 4to. London.
1802 Mathematical Principles of Natural Philosophy, translated and illustrated with a Commentary, by Dr. Thorpe. 4to. London.
1738 Elémens de la Philosophie, par Voltaire. 8vo. Amsterdam.
1759 Principes Mathématiques de la Philosophie Naturelle par Mad. du Châtelet. 2 vols. 4to. Paris.
1752 Elémens de la Philosophie, par Voltaire. 8vo. Dresden.
1781 Philosophiæ Naturalis Principia Mathematica. 4to. Dessoviæ. (TESSANECK).

1699 Barrow's Optical Lectures, edited by Sir I. Newton. 4to. Londini.
1704 Optics; or a Treatise of the Reflections, Refractions, Inflections and Colours of Light. Also two Treatises of the Species and Magnitude of Curvilinear Figures. 4to. London.
1730 Treatise of Optics. 8vo. London.
1721 Treatise of Optics. 8vo. London.
1714 Treatise of Optics. 8vo. London.

1745 Two Treatises of the Quadrature of Curves, by Stewart. 4to. (*vid.* Watts.)

1706 Optica, Latinè reddita a Sam. Clark, necnon ejusdem Tractatus duo de Speciebus, etc. Fig. Curvilin. 4to. Londini.
1719 ——— Idem. 4to. Londini.
1721 ——— Idem. 8vo. Londini.
1728 ——— Idem. 8vo. Londini.
1740 ——— Idem. 4to. Lausanne.
1773 ——— Idem, accedunt ejusdem Lectiones Opticæ, et Opuscula ad Lucem et Colores Pertinentia. 4to. Patavii.
1729 Lectiones Opticae. 4to.
1728 Optical Lectures read in the Public Schoos. 8vo. Cambridge.

1762 De Quadratura Curvarum, ed. Melander. 4to. Lipsiæ.
1740 Genesis Curvarum per Umbras, seu Perspectivæ Universalis Elementa Exemplis Coni Sectionum et Linearum Tertii Ordinis illustrata, 4to. L. Bat.
1746 Genesis Curvarum, etc. 8vo. London, (ed. Murdoch.)

1797 Enumeratio Linearum Tertii Ordinis, edidit Stirling. 8vo. Paris.

Newton's System of the World in a Popular Way.

1727 System of the World in a Popular Way. 8vo. London.
1728 De Mundi Systemate. 4to. Londini.
1731 De Mundi Systemate. 4to. Londini.
1747 Weltw[illegible] für Ungebildete. 8vo. Brunswick.

1733 Construction d'un Télescope Reflexion. 4to. Paris.
1731 Tables for Renewing and Purchasing Leases. 12mo. London.
1808 Tables for Renewing and Purchasing Leases. 12mo. London.
1741 Metaphysik (in German) 8vo. Leipzig.
1717 Postscript and Letter of Mons. Leibnitz to the Abbé Conti, with remarks and a letter to the Abbé
1756 Four Letters to Bentley on the Existence of a Deity. 8vo.
1733 Observations on Daniel and Revelations. 4to. London.
1765 Beobachtungen uber Daniel und die Offenbarung Joannis. Liegnitz. 8vo.
1737 Observationes in Danielem et Apocalypsin Joannis, Latine vertit Sudemann. 4to Amstelodami.
Corollaries by Whiston.

LIFE OF MAHOMET.

Introduction.

Sect. I.—In the seventh century of the Christian era a revolution took place in the religion of the Arabian people, which not only changed the manners and institutions of the Arabians themselves, but materially influenced the destinies of the largest portion of the civilised globe. The wandering and insignificant tribes of Arabia were by this religion united into a powerful nation, filled with a spirit of desperate enthusiasm, and sent forth to be the conquerors of the greatest part of Asia, of all the civilised people of Africa, and some of the most powerful kingdoms in Europe. In a few years these enthusiastic warriors spread their new faith from the Ganges to the Danube.

Mahomet[*] was the author of these mighty changes. Arising amidst a rude and ignorant people, he assumed the attributes of the Messenger of God; he declared himself to be divinely inspired; to be expressly sent among mankind to overturn the idolatrous worship of his countrymen, and to establish in its place a new and more pure religion, dictated by the Almighty himself, and destined eventually to be the faith of all the nations of the earth. His countrymen believed in these magnificent pretensions; elected him to be their ruler, and quietly submitted their necks to the yoke of the absolute despotism which he instituted. The history of this extraordinary man with an account of the institutions which he framed, we are about to lay before our readers.

Previous, however, to any history of the Arabian prophet, a short description must be given of the Arabian people at the time of his appearance. To know precisely what alterations he effected, and the good or evil of those alterations, we should learn the state of civilisation, the religion, government, and manners, which he attempted to improve.

Before we can decide whether the changes he introduced were changes for the better, we must erect some certain standard of excellence with which we may compare both the institutions which he originated, and those which he found already established. Upon the results of this comparison alone, can we estimate the character of the Arabian legislator. Our limits, indeed, will not permit us to perform this comparison as minutely as we could wish: we must indicate rather than describe the standard to which we refer; must present merely a sketch of the important particulars of his institutions, and upon this imperfect evidence pronounce the most impartial judgment we are able.

DESCRIPTION OF ARABIA.

Arabia, the country of Mahomet, has at all times been an object of curiosity to the intelligent observer, both on account of the peculiarities of its soil and climate, and the remarkable character of its inhabitants. Arabia *Proper* is bounded on the north-east by the Persian Gulf; on the south-east by the Indian Ocean. The Red Sea extends along the whole of its south-western coast; and an imaginary line drawn from the head of the Persian Gulf, to that of the Red Sea, completes the limits of the peninsula. The country contained within these limits exceeds above four times the magnitude of Germany or France[*]. More extended limits, however, are often assigned to the country designated by the term Arabia. Beyond the imaginary line running from Ailah, at the head of the Red Sea, to the head of the Persian Gulf, the territory of Arabia is sometimes made to extend on the west to Palestine, the isthmus of Suez and Syria; on the east to the Euphrates, and on the north to Syria, Deyar Becr, Irak, and Kuhestan[†]. By the Greeks and Romans Arabia was usually divided, on account of the differences of the soil, into the Sandy, the Stony, and the Happy. By the Arabians themselves this division has not been adopted. The territory of Arabia *Proper*, bounded as we have described, was separated by them into five distinct provinces, viz. Hejaz, Yaman, Tehama, Naja, and Yamina. In the Happy Arabia, which occupied the greater part of the coast running along the Red Sea, and in the province of Hejaz, are situated the two famous cities of Mecca and Medina. The former was the birthplace of Mahomet; the latter, when he fled from Mecca, was the city of his refuge, the scene of his first victories—the first country over which he ruled with the authority of a king, and his last resting-place on earth. He died and was buried at Medina.

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[*] *Mohammed* is the correct orthography; we have, nevertheless, for obvious reasons, retained the more popular form.

[*] Gibbon's Decline and Fall, c. 50, p. 76.

[†] Anc. Univ. Hist., b. 4, c. 21, p. 336. To those desirous of a particular description of the geography of Arabia we cannot do better than recommend M. D'Anville's Map; and the chapter of the Universal

Arabia is situated under the burning sun of the tropics, and covered for the most part with arid sands, and barren, naked mountains. One part is somewhat exempt from this sort of soil. The hills at a small distance from the coast of the Red Sea are less barren, less scorched than the other parts of the country. The springs of water are there more numerous; the water less disgusting, the air more temperate: when compared with the parched and sandy deserts by which it is surrounded, it may appear an earthly paradise. This Happy Arabia, however, has no navigable rivers, few springs the waters of which are drinkable, and no productions save coffee and frankincense to exchange for the commodities of other countries. Having moreover few manufactures, it is poor both in the luxuries and comforts of life[*].

INHABITANTS.

The inhabitants of Arabia are usually divided into two classes, viz. the Arabs of the deserts, or dwellers in tents, and the Arabs of the cities.

DESERT TRIBES.

The Arabs of the deserts are roving bands that wander with their herds over the immense sandy regions of which their country is composed: living partly by the flesh and milk of their camels, partly by the plunder of the caravans which traverse their desolate plains. One illustration amongst a thousand that might be offered, is sufficient to mark their savage condition, and wild, predatory manners. As a mortification by which they hope to please the Divinity, at certain seasons of the year religious truces were observed. They thus, by way of penance, obliged themselves to observe the regulations of civilised society. "It was a custom among the ancient Arabs to observe four months in the year as sacred, during which they held it unlawful to wage war, and took off the heads of their spears; ceasing from incursions and other hostilities. During these months, whoever was in fear of his enemy lived in full security; so that, if a man met the murderer of his father, or his brother, he durst not offer him any violence. . . . . Some of them, weary of sitting quiet for three months together, and eager to make their accustomed incursions for plunder, used by way of expedient whenever it suited their inclinations or convenience, to put off the observance of *Al Moharram* to the following month *Safar*[*]."

Among a people thus unsettled, all government was, as might have been expected, exceedingly fluctuating and uncertain. They were not reclaimed from that barbarous state, in which the strong plunder the weak with impunity. Every man pursued his enemy, without recurring for assistance to the magistrate; and inflicted that punishment which his power and vengeance combined enabled and incited him to inflict. The authority of the magistrate was a shadow: the chief of a tribe might indeed sometimes obtain considerable personal influence; it was the man, however, not the office of magistrate, that was respected. Like all rude people, the Arabs were divided into several petty tribes, which were in fact so many separate nations; and the only species of government acknowledged by those inhabiting the deserts, was a nominal obedience paid by the members of the tribe to their elected chief. As among other nations in the same state of civilisation, their leaders governed rather by

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History here quoted. Neither our limits nor our design permit us to be more minute.

[†] Sale's Pre. Disc., p. 3. Gibbon's Decline and Fall, c. 50. Niebuhr, c. 62. p. 86 Pinkerton's Collection. The limits of the Happy Arabia are variously assigned; the difference is a matter of little consequence.

[*] Sale's Pre. Dis. pp. 196, 198. Prideaux, Vie de Mahomet, p. 96. *Moharram*—that which is sacred and forbidden by the law. The first month of the year was called Moharram, because war was *forbidden* during its continuance. D'Herbelot, Bib. Orient. Safar was the second month.

example than commands [*]. The chiefs were always the companions and guides of their tribes in arms; and sometimes the umpires of private disputes. The much vaunted independence of the Arab people, however, when closely investigated, appears little worthy of admiration. It consisted in the independence of the heads of families. The head of a family was subjected, or rather yielded obedience, to no one. But he exercised the most despotic sway over his own family. Wives, children, slaves were all completely under his uncontrolled dominion; and this patriarchal government as it is called, while receiving praises as a system of nearly perfect freedom, held nine-tenths of the people in the most abject slavery [†].

Law, in such circumstances, could not be said to exist: written or unwritten, it was unknown to these wandering nations; unless we term *law* that sort of wavering opinion concerning honour in engagements, which necessity creates in every society however barbarous. This rude code of honour, as in all savage tribes, was handed down from generation to generation in a species of uncouth poetry, which, while it assisted the memory, delighted also the imagination of these barbarians. "God," said they, "has bestowed four peculiar things on the Arabs; that their turbans should be to them instead of diadems; their tents instead of walls and houses; their swords instead of intrenchments; and their poems instead of written laws [‡]." They could hardly have said any thing more descriptive of an uncivilised people.

ARABS OF THE CITIES.

The inhabitants of the cities were a still more remarkable race, for although they had abandoned the wandering life of their brethren, and taken up their abodes in cities, they were yet often induced to leave their homes, and indulge in the more active and uncontrolled life of the desert. Though living for the most part by merchandise and manufactures, they also participated in the business of robbery in the desert. The life of the merchant was not found incompatible with that of the soldier, or rather robber; and he who to-day was in his counting-house, or work-shop, might, to-morrow, be at the head of his country's troops, or serving in the ranks as a soldier [*]. The children of the cities were often confided to the tribes of the desert; and thus became early inured to the toilsome and dangerous life of the wandering Arab [†].

The inhabitants of Mecca, Medina, and the other cities thinly scattered along the shores of the Red Sea, appear to have been chiefly employed as wandering merchants. The tribes of the deserts brought whatever productions their country afforded, for the most part ostrich feathers, coffee, and frankincense, to the cities on the coast; and received in exchange the commodities which the city merchants had obtained at the fairs of Syria, Palestine, and Egypt. The traffic with these countries was carried on by means of caravans of camels; the merchants, like the travelling merchants or pedlars of the present day, accompanying their goods, and superintending the sale and purchase [‡]. By them was carried on the chief part of the trade existing between the Roman provinces, and the countries of the east; and the port of Jidda on the Red Sea was long celebrated as the emporium of Indian commerce [§]. This constant communication with more polished nations must, in some measure, have improved this portion of the Arabian people. They were, nevertheless, little better than barbarians. Neither on account of their government, their laws, their religion, their literature, nor their manners, did they deserve any other title[*].

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[*] Tacitus, Germ. c. 7.

[†] Niebuhr's Travels, c. 62, p. 84, Pinkerton's Collection.

[‡] Sale's Pre. Disc., sec. 1, p. 38. Goguet, Origine des Lois, 1 Epo. p. 98. Mill's British India, b. 2, c. 9, p. 362, quarto ed. For a description of the *wandering* Arabs, see Niebuhr's Travels, c. 98, Pink. Collection, p. 181. There is every reason to suppose that their manners have remained unchanged from the time of Mahomet to the present day.

[*] "Mirum dictu, ex innumeris populis pars æque in commerciis aut in latrociniis degit," was the expression of Pliny. (Hist. Nat. vi. 32.) This division of their time between robbery and commerce was the same in the days of Mahomet. Gibbon's Dec. and Fall, c. 50. Mod. Univ. Hist., vol. i., b. 1, c. 1, p. 27.

[†] Mod. Univ. Hist., b. 1, c. 1, p. 23. Gagnier, Vie de Mah., p 86. "This was the season of the year in which the nurses of a country called *Badias*, that is, *pays champêtre*, came in great numbers to Mecca for the purpose of obtaining children to nurse. . . . . . Helima took him (Mahomet) into her own country, in which the air was temperate, as well on account of the fertility of the soil, as the sweetness of its waters." The *pays champêtre* of Gagnier appears to mean the wild country inhabited by the desert tribes.

[‡] These caravans, like those of present times, were assemblages of merchants, who travelled in large numbers, to protect themselves against the attacks of the predatory desert tribes. Hostile tribes constantly endeavoured to capture the caravans of their enemies, much after the manner of European nations, plundering the vessels of industrious individuals, in the hopes of weakening the hostile nation. See Sale's Pre. Disc., sec. 1. p. 32. Prideaux, Vie de Mahomet, p. 10.

[§] Prideaux, Vie de Mahomet, p. 11.

Like the Arabs of the deserts, the inhabitants of the cities were divided into separate tribes; and not only were the different cities unconnected by the bond of a general government, but the citizens of one town were divided into tribes; each one acknowledging a separate chief, and regarding every other tribe with bitter and interminable hatred. The chiefs derived their power as well from their birth as their personal worth, the people electing them out of certain families, yet having perfect liberty to choose that member of the family who was most agreeable to them[†]. "The Bedouins, or pastoral Arabs, who live in tents, have many schiechs (*i. e.* chiefs), each of whom governs his family with power almost absolute. All the schiechs who belong to the same tribe acknowledge a common chief, who is called Schiech es Schuech, Schiech of Schiechs, or *Schiech el Kbir*, and whose authority is limited by custom. The grand schiech is hereditary in a certain family; but the inferior schiechs upon the death of a grand schiech choose the successor out of his family, without regard to age or lineal succession, or any other consideration, except superiority of abilities[‡]." The chiefs of the cities were elected much after the same manner.

GOVERNMENT.

The various provinces were split into small, independent states, possessing governments apparently different, though essentially the same[§]. In some a single prince, in others, the heads of tribes, who were really a band of princes, ruled like the rajahs of Indostan, or the satraps of Persia, with despotic sway over the people within their dominion. To this dominion there was no check but the dread of insurrection: there were no established *forms in the government*, no certain and specified *laws*, by which it could be controlled; neither did the *manners* of the people serve to diminish its mischievousness. Insurrection was the only existing check; and did no doubt in part keep down the atrocities of these rulers; but be it remembered that in every stage of society misery to a lamentable extent may be produced before the people can determine to brave the difficulties and dangers of an insurrection. Still more completely to ensure the subjection of the people, these rulers seized upon the functions and powers of religion. The ruling men were invariably the priests of the people, the propounders of oracles, and the guardians of the temples and idols[*]. The mysterious terrors of religion were thus added to the real dangers attendant on an opposition to the will of the governors. That will consequently was almost despotic. "After the expulsion of the Jorhamites, the government of Hejaz seems not to have continued for many centuries in the hands of one prince, but to have been divided among the heads of tribes; almost in the same manner as the Arabs of the deserts are governed at this day. At Mecca an aristocracy prevailed, where the chief management of affairs till the time of Mahommed was in the tribe of Koreish; especially after they had gotten the custody of the *Caaba* from the tribe of Kozrah[†]." But if the government were not better than that of the desert tribes, miserable indeed must have been the situation of the people. When men are congregated into cities, if every one be allowed to gratify his revenge, and punish his enemy, without recurring to the arbitration of the magistrate, the state must necessarily become one continued scene of violence and bloodshed. No security for person or property existing, there could be no accumulation, so that the horrors of poverty must necessarily have been added to the other evils arising from unceasing terror and alarm. Such was in reality the situation of the Arabian cities; every man sought to redress by his own power the injury he fancied he had received; and the peace and happiness of the community were destroyed. The heads of tribes, moreover, waged continual war with each other. In the desert they were sufficiently willing to take offence at each other's conduct: opportunities of offence, however, on account of the immense extent of these desert regions, were far less frequent than within the narrow bounds of a city. Contact created rivalry—rivalry in power, in display, in enjoyment: rivalry begat hatred; and hatred bloodshed. To gratify the morbid vanity of a chief, the whole tribe was in arms. "This multiplicity of petty sovereigns occasions several inconveniences to the people in general. Wars cannot but be frequent among states whose territories are so intermingled together, and whose sovereigns have such a variety of jarring interests to manage. . . . . No doubt such a multitude of nobles and petty princes, whose numbers are continually increased by polygamy, must have an unfavourable influence upon the general happiness of the people. It strikes one with surprise to see the Arabs, in a country so rich and fertile, uncomfortably lodged, indifferently fed, ill clothed, and destitute of almost all the conveniences of life. But the causes fully account for the effects. . . . . Those living in cities, or employed in the cultivation of the land, are kept in poverty by the exorbitancy of the taxes exacted from them. The whole substance of the people is consumed in the support of their numerous princes and priests *."

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[*] See, for a minute description of the laws and customs of the Arabs, Anc. Univ. Hist., vol. xviii., b. 4, c. 21. This description is by Sale.

[†] A curious plan was adopted in some places. "The order of succession in these cities was not hereditary, but the first child born in any of the noble families, after the king's accession, was deemed the presumptive heir to the crown. As soon, therefore, as any prince ascended the throne, a list was taken of all the pregnant ladies of quality, who were guarded in a proper manner till one of them was delivered of a son, who always received an education suitable to his birth." (Anc. Univ. Hist., vol. xviii., b. 4, c. 21, p. 377.)

[‡] Niebuhr's Travels, c. 62, p. 84.

[§] Mod. Univ. Hist. b. 1, c. 1, p. 41. Sale's Pre. Disc., s. 1, pp. 12—15. Gagnier, Vie de Mah. vol. i. p. 18.

[*] Mod. Univ. Hist., b. 1, c. 1, p. 7. Gagnier, Intr. Vie de Mah. pp. 51—53.

[†] Caaba was a temple at Mecca, held in extraordinary veneration by the people of Arabia universally, (Sale's Pre. Disc., see p. 15,) and to which pilgrimages were made. Mahomet continued the practice. (Gagnier, Intro. Vie de Mah. pp. 56, 57.) Thus, like many other propagators of religion, moulding the forms of the religion which he attacked, to suit that which he preached.

LAW.

Added to this rude government was an equally imperfect *law*. The law, in fact, seems to have been in the rudest possible state; there being neither a written code, nor any collection of judicial decisions which successive judges were enjoined to follow. Judicial decisions were consequently in complete accordance with the desires of the rich. In a country where there is an established code to which every judge must adhere, justice for the most part is impartially administered. Some plausible reason must be assigned for every deviation; the approval of the government, the men of the law, and even of the people, must, in some measure, be obtained; and by this means a check is created, sufficient, in general, to protect the community from the grossest excesses of injustice. Under a despotic government, indeed, the law is obliged to yield to the will of the prince. When he wishes oppression, oppression is exercised. These cases must of necessity form but a small part of the whole number which come before the judge for decision; and when the will of the prince is not opposed to justice, the judge finds himself obliged to adhere to the letter of the law, that being, in fact, the will of the prince. Imperial Rome, France, and Germany, in which justice has been administered under a despotic monarch, according to a written code, are evidence of the truth of these observations. Where law had not been digested into a code, but is composed of recorded decisions, the consequence is nearly the same. "When on any particular portion of the field of law," says the philosophic historian of British India, "a number of judges have all, with public approbation, decided in one way, and when those decisions are recorded and made known, the judge who comes after them has strong motives of fear and hope, not to depart from their example *." But of law, either of one kind or the other, the Arabians were utterly destitute. The judge, that is the head of the tribe, decided according to what he deemed to be justice; and his unrecorded decision had no influence upon that of his successor. Uncertainty to the greatest possible extent was the necessary consequence. Those who sought a decision at the hands of the judge, found him unchecked by any existing law, and ready to listen with complacency to the suggestions of interest. He, therefore, who was the most powerful, or the most wealthy, had a certainty of success. Any change from such a state must have been a change for the better.

RELIGION.

Although the Romans made no extensive or permanent conquests in Arabia, the effects of their near neighbourhood were visible among the Arabian population. The constant disputes between the Christian sects of Syria, and the depressed situation of the Jewish people among the Christians, induced many of both persuasions to seek refuge among the idolatrous Arabs, who knew not, or knowing, regarded not, the differences in their creeds. Enjoying peace and security, these differing sects continued to increase in numbers, in wealth, and in power; and before the appearance of Mahomet spread their religion over the greatest part of Arabia. The tolerant spirit of the Arabian religion allowed them unmolested to erect places of worship, and to educate their children each according to his faith. This perfect freedom multiplied the Christian sects, and Arabia was long famous as being the prolific mother of heresies *.

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* Niebuhr, c. 62, p. 86.

* Mill's Hist. of Brit. India, b. 2. c. 4, p. 170.

The larger portion of the population, however, still adhered to their own national worship; which partook largely of the rude character that marked their other institutions. The conception which an ignorant and trembling savage forms of the character of the Divinity, and the means by which he endeavours to secure his favour, are in every age and country the same. He conceives the Godhead as irritable and revengeful; endowed with the moral weaknesses of humanity, but possessed of irresistible power. Heaven, in the imagination of the barbarian, is a picture of the earth, with this addition, that every circumstance is magnified. In heaven there are more delightful gardens, more delicious and balmy airs, more brilliant skies, than on earth. The beings who inhabit the heavens are more powerful, more wise, or rather, more capable of obtaining the objects they desire, than men; they are endowed with everlasting life, and subject to no diseases that afflict humanity. To please these divine beings, the trembling votary pursues the means that are found efficacious with earthly potentates. He prostrates himself before them in adoration; he exaggerates their perfections, and soothes them with continued adulation. To prove himself sincere, he subjects himself to useless privations; performs frequent, painful, fruitless, and expensive ceremonies. He subjects himself to fasts; he multiplies the observances of religion, and throws away his substance in manifestation of their honour. Solicitude in the regulation of his conduct, as it regards his own happiness, or that of his fellows, being intimately connected with his own interests, is considered no proof of the sincerity of his professions towards the Divinity. The laws of morals, therefore, form but a small part of the religious code of any barbarous nation. The religion of the barbarous Arabian differed in no one particular from the foregoing description.

The ancient Arabs are supposed to have been what are termed pure theists: that is, they are supposed to have believed in, and worshipped, one, sole, omnipotent, and everlasting God. Historians, however, have seldom correctly appreciated the meaning of these magnificent expressions in the mouth of a savage. In his mind such language is connected with ideas and feelings far other than those which a civilised man would express by it. These splendid epithets are the mere expressions of flattery and fear. The deity, now addressed, and whose favour is the object of present desire, is for the time the sole object of adoration. The very same savage, who believes in a host of gods, will address each of them by the term of THE ONE. If among many deities one is thought more powerful than the rest, he will be the oftenest addressed, the oftenest soothed by flattery. No epithet is so flattering as that which asserts his single existence. It exalts him above all beings, and leaves him without a rival. No epithet, therefore, will be so frequently employed. Being the most constantly adored, this more powerful divinity will have this epithet expressive of his sole existence so frequently connected with his name, that it will at length be regularly attached to, and form part of, that name. This was precisely the case with the Arabian objects of worship. It is strange that when complete evidence of this fact exists, really intelligent and circumspect historians should have believed in the pure theism of the Arabians. Sale, like many others, was deceived by pompous expressions:— "That they acknowledge one supreme God, appears (to omit other proof) from their usual form of addressing themselves to him, which was this: 'I dedicate myself to thy service, O God!—I dedicate myself to thy service, O God! Thou hast no companion, except thy companion of whom Thou art absolute master, and of whatever is his.'" In the very next passage, however, Sale adds, "they offered sacrifices and other

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* Anc. Univ. Hist., b. 4, c. 21, pp. 378—392. Koran, Sale's trans., c. 53. Sale's Pre. Disc., s. 2, pp. 45, 46. Gibbon's Dec. and Fall, c. 50, p. 99. Pocock's notes to his translation of Abulpharagius, p. 136. Niebuhr states that in his time the Jews were in many parts of Arabia independent nations, and exceedingly numerous, (c. 69, pp. 92, 93.)

offerings to IDOLS, as well as to God, who was also often put off with the least portion, as Mahomet upbraids them[*]." Their scheme of divine government was simple, and like most others formed in the same state of civilisation. One god was supposed to be the supreme ruler; and subject to his sway was a vast multitude of inferior deities[†]. "The Arabs acknowledged one supreme God, the creator and lord of the universe, whom they called Allah Taala, the most high god; and their other deities, who were subordinate to him, they called simply Al Ilahat, *i. e.* goddesses[‡]." Idols were set up, and worshipped; every field, every rivulet, had its divinities. The fixed stars and planets were also exalted into gods, and as such received adoration. Heaven, moreover, was peopled with angels, who, with the wooden stone, and clay idols on earth, were regularly worshipped. How the Arabians can be supposed believers in a single godhead, under such circumstances, appears extraordinary[§].

The manner in which these various divinities were rendered propitious, at once marks that no very exalted conception of a divinity existed in the minds of these barbarians. Fasts, pilgrimages, sacrifices, long and unmeaning prayers, were the means employed to obtain the divine favour.

"They are obliged to pray three times a day (some say seven times a day:) the first, half an hour or less before sunrise, ordering it so, that they may, just as the sun rises, finish eight adorations, each containing three prostrations: the second prayer they end at noon, when the sun begins to decline, in saying which they perform five such adorations as the former; and the same they do the third time, ending just as the sun sets. They fast three times a year: the first thirty days, the next nine days, and the last seven. They offer many sacrifices, but eat no part thereof, but burn them all. They abstain from beans, garlic, and some other pulse and vegetables[*]."

"The same rites which are now accomplished by the faithful Mussulman, were invented and practised by the superstition of the idolaters. At an awful distance they cast away their garments; seven times, with hasty steps, they encircled the Caaba, and kissed the black stone; seven times they visited and adored the adjacent mountains; seven times they threw stones into the valley of Mina, and the pilgrimage was achieved as at the present hour, by a sacrifice of sheep and camels, and the burial of their hair and nails in the consecrated ground . . . . . . From Japan to Peru the use of sacrifice has universally prevailed; and the votary has expressed his gratitude or fear, by destroying or consuming, in honour of the gods, the dearest and most precious of their gifts. The life of a man is the most precious oblation to deprecate public calamity; the altars of Phœnicia and Egypt, of Rome and Carthage, have been polluted with human gore; the cruel practice was long preserved among the Arabs. In the third century a boy was annually sacrificed by the tribe of the Dumatrians; and a royal captive was piously slaughtered by the prince of the Saracens, the ally and soldier of the emperor Justinian. A parent who drags his son to the altar exhibits the most sublime and painful effort of fanaticism; the deed or the intention was sanctified by the example of saints and heroes; and the father of Mahomet himself was devoted by a rash vow, and hardly ransomed by the equivalent of an hundred camels."[†] Such was the religion that Mahomet endeavoured to improve.

SCIENCE AND LITERATURE.

It may easily be supposed that a people, possessed of a government, law, and religion, such as we have described, were little advanced in science or literature. The only science to which the ancient Arabs made the slightest pretension, was that of astronomy; and even in astronomy they had discovered little beyond the ordinary knowledge of an ignorant savage. Through the trackless deserts of Arabia it was impossible to travel without the aid of some sign in the heavens as a guide. The need of such a guide led them to watch the revolutions of the heavenly bodies; and the clear and unclouded skies of the country offered few obstacles to their search. They could not in time fail to observe some of the more obvious phenomena, and to be able in a long course of years to predict the recurrence of those phenomena. Some few extraordinary persons seem to have been capable of calculating eclipses with tolerable accuracy. This knowledge, however, was exceedingly rare, and beyond it they never advanced. Any thing like a theory, or general expression of the stated order in which the celestial phenomena occurred, never entered into their imaginations. That certain changes happened, they knew; but of the true system of the universe, or of any system whatever, they were profoundly ignorant[*]. Astrology, indeed, they studied with some assiduity, and implicit confidence; but the most important of their sciences, that to which they paid the greatest attention, was the interpretation of dreams[†]. The following is a specimen of their state of ignorance and superstition: "When any of them set out upon a journey, he observed the first bird he met with, and if it flew to the right, he pursued his journey; but if to the left, he returned home . . . . . . When a person, distrusting the fidelity of his wife, went a journey, he tied together some of the boughs of a tree, called *al rataim;* and if, on his return, he found them in the same position, he judged she had been faithful to him; if otherwise, not[‡]."

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[*] Sale, Pre. Disc., p. 21.

[†] "Divûm pater atque hominum rex,"
O pater, O hominum Divûmque æterna potestas,"
are expressions conveying an exact conception of the Arabian theology.

[‡] Sale, Pre. Disc., p. 20.

[§] "The Sabians of Mount Lebanon seem to pay a greater regard to Seth than the Supreme Being; for they always keep their oath when they swear by the former, but frequently break it when they swear by the latter."—(Anc. Univ. Hist., b. iv., c. 21, p. 383.) ".A merchant of Mecca made an observation upon those saints, which I was surprised to hear from a Mahometan. The vulgar, said he, must always have a visible object to fear and honour. Thus, at Mecca, oaths, instead of being addressed to God, are pronounced in the name of Mahomet. At Mokha, I would not trust a man who should take God to witness the truth of any thing he happened to assert; but I much more safely depend upon him who should swear by Schiech Ichadeli, whose mosque and tomb are before his eyes."—(Niebuhr, p. 76.) Pocock, in his notes to his translation of "Abulpharagius" (p. 136.) states the worship of angels and demons to have been common among the Arabs.

[*] Sale, Pre. Disc., p. 19.

[†] Gibbon, Decl. and Fall, c. 50, pp. 95, 96.

Their eloquence and their poetry have been considered evidence of a high state of civilisation. But the savages of North America have been long famed for their eloquence; and the bards of our barbarian ancestors prove that savages have possessed, and been delighted with poetry. The eloquence and poetry of a barbarian, bear, however, little resemblance to the eloquence and poetry of civilised life, being made up chiefly of bold figures and bombast expressions, without order, without propriety, and generally without meaning. The *species* of estimation, also, in which poetry was held among the Arabs, shows their rude and uncultivated condition. It was held in esteem as a means of preserving the remembrance of past events. Poetry assists the memory; and consequently the history, laws, and dogmas of religion, are universally among a rude people recorded in verse[*]. In the absence of written signs, verse may be of use in this way, but, when writing is known, can, for such a purpose, be no longer serviceable. That the Arabs generally were ignorant of writing is universally asserted. In after times, the Arabians, like other people, emerged from this state of ignorance. The age of Arab learning and literature, however, was more than two centuries after the death of Mahomet. When masters of Syria and Egypt, they became acquainted with the writings of the Greek philosophers, and for a long period were far superior to the nations of Europe in knowledge and civilisation.

MANNERS.

In spite of their ignorance, the Arabs have by historians been almost universally deemed a gentle and polite people; and an argument has, from this circumstance, been hastily drawn against the utility of all knowledge and cultivation. Nothing, however, can well be more untrue than the premises upon which this conclusion is founded.

Two circumstances have chiefly been insisted on, in favour of the Arab people: their hospitality and their politeness. The meaning of these terms, however, when applied to them, is sometimes misunderstood. The general conduct of the Arab was to plunder and to kill every defenceless traveller whom he chanced to meet[†]. There were particular cases in which he abstained from this barbarity; when, instead of robbing, he assisted the way-faring traveller. This extraordinary abstinence has been exalted into the virtue *hospitality*. He was thus generous to those of his own tribe, and to those who possessed a passport from his chief; to others, he was a thief and a murderer. In a civilised country abstinence from plundering any one, whether kindred or not, is not exalted into a virtue; and for this simple reason: it is imposed by the law as an *obligation* upon every one; every infringement of it is punished; and so common is this boasted virtue, that the *absence* of it alone creates our wonder.

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[*] See Goguet, Orig. des Lois, 1 Epo. l. 3, p. 147, where the necessity, under which the Arabians lay, of some sign to guide them in their travels, is well explained. Also Abulpharagius, Pocock's translation, p. 6. The Arabian fairly acknowledges his countrymen to have been completely ignorant of the *science* of astronomy.

[†] Anc. Univ. Hist., b. iv., c. 21, p. 406—412.

[‡] Ibid. p. 412.

[*] See Goguet, Orig. des Lois, 1 Epoc., l. 1 pp. 43, 44. Henry (in Hist. of Britain, b. 1, c. 2 sec. 1, p. 163, states,) that the Ancient Britons were a very poetical people.

[†] Sale, Pre. Dis. pp. 196—198. Prideaux, Vie de Mah., p. 95.

The traveller in the desert, or in any wild country, would perish if the few inhabitants that are scattered over its surface were to refuse him aid and shelter. But to save the life of a fellow creature, without risk or trouble to ourselves, is surely no great exercise of virtue; and so obvious is the necessity of such mutual assistance in a rude state of society, that no people placed in such circumstances ever failed to hold in high estimation, and also in some measure to practise, this species of hospitality.

When a country becomes thickly inhabited, the necessity for hospitality no longer exists, it consequently ceases to be praised or regarded. The traveller to whom I should refuse admittance, can find immediate refuge at the next inn; and consequently will not subject himself to the mortification of a refusal. The following exceedingly sensible observations cannot but be acceptable to the reader: "I forgot to speak of hospitality. It is on account of this virtue that the first ages have usually been esteemed . . . . . . A common interest apparently gave birth to this habit. There were no inns in the distant ages of antiquity. Hospitality was, therefore, exercised in hopes of a return of the like good office. A stranger was received, under the supposition that he might some day render the same service, should there be a necessity of travelling into his country; for hospitality was reciprocal. By receiving a stranger into his house, a man immediately acquired a right to be received into the stranger's; and this right was by the ancients regarded as sacred and inviolable, extending not only to those who contracted it, but also to their children and descendants. Besides, hospitality in those early days was not very expensive, as people travelled with few attendants. In short, the Arabs of the present day prove that hospitality is compatible with the greatest vices; and that this species of virtue is no evidence of goodness of heart or rectitude of manners. The general character of the Arabs is well known; no people, however, are more hospitable*."

The politeness of an Arab is also something very different from the politeness of a civilised man. True politeness or courtesy consists in taking no offence where offence is not intended, and in so managing the common intercourse of life, that the forms adopted shall conduce to the ease and happiness of all parties concerned. All formalities that do not tend to this end, all distinctions that oppose it, are so many marks of rudeness and ignorance. How far the Arabs were from this standard, the following circumstance will testify:—

"The Arabs show great sensibility to every thing that can be construed into an injury. If one man should happen to spit beside another, the latter will not fail to avenge himself of the imaginary insult. In a caravan I once saw an Arab highly offended with a man who, in spitting, accidentally bespattered his beard with some small part of his spittle. It was with difficulty that he could be appeased by him, who, he imagined, had offended him, even though he humbly asked pardon, and kissed his beard in token of submission. . . . . . But the most irritable of all men are the noble Bedouins, who, in their martial spirit, seem to carry those same prejudices even farther than the barbarous warriors who issued from the north, and overran Europe. Bedouin honour is still more delicate than ours, and requires even a greater number of victims to be sacrificed to it. If one schiech says to another, with a serious air, thy bonnet is dirty, or the wrong side of thy turban is out, nothing but blood can wash away the reproach; and not merely the blood of the offender, but also that of all the males of his family†." Who, when cursed with so punctilious and bloody minded a neighbour as this, would not be careful in his conversation and conduct?

"The refined malice of the Arabs refuses even the head of the murderer, substitutes an innocent to the guilty person, and transfers the penalty to the best and most considerable of the race by whom they have been injured. If he falls by their hands, they are exposed in their turn to the danger of reprisals; the interest and the principal of the bloody debt are accumulated; the individuals of either family lead a life of malice and suspicion, and fifty years may sometimes elapse before the account be finally settled[*]."

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* Goguet. Orig. des Lois, 1 Epo., l. 6, p. 387.

† Niebuhr, c. 107, p. 144.

The condition of the women may be taken as an accurate criterion of the politeness of a people. If we judge of the Arabs by this test, they will be considered barbarians. Even in the Koran, which certainly is an improvement on the previous manners of the Arabs, we find the following command:—

"But those wives, whose perverseness ye shall be apprehensive of, rebuke, and *remove into separate apartments, and chastise them*[†]."

"It must be remembered," says Sale, "that though by the Mahommedan law, a man is allowed to repudiate his wife, even on the slightest disgust, yet the women are not allowed to separate themselves from their husbands, unless it be for ill usage, (we have seen that beating them was not considered ill usage,) want of proper maintenance, neglect of conjugal duty, or some other cause of equal import; *but then she loses her dowry* (that is, when ill-treated, and seeking redress at the hands of justice, redress is given, but the means of subsistence are taken away,) which she does not, if divorced by the husband, unless she has been guilty of impudicity or notorious disobedience[‡]," of which men were the judges. In another passage, he says, "they disposed of widows even against their consent, as part of their husbands' possessions[§]."

In short, the women were absolute slaves; the mere instruments of their husbands' pleasure; confined, neglected, and despised. Professor Millar, in his work on the "Origin of Ranks," has acutely remarked, that the custom so prevalent in ancient times of the bridegroom giving presents to the father of the bride, was, in reality, nothing less than a custom of *buying* the daughter. That the Arabians followed this custom, is admitted by the Arabian authors themselves. Ali, on his marriage with Fatima, the daughter of Mahomet, gave to him, according to tradition, twelve ounces of ostrich feathers, and a breastplate[*]. That this was, in fact, a purchase, is shown by the manners of the Arabians of the present day, who preserve the custom, and do not attempt to conceal the nature of it[†]. It is almost needless to say, that slavery of the very worst description must necessarily be the heritage of the women, where such a custom exists. Taught to consider themselves the property of their purchasers, they must, moreover, become degraded in their mental and moral character; and their masters, also, cannot but feel the baneful influence of this abominable traffic. Any institution which permits men to exercise irresponsible power; which, above all, makes the exercise of it, daily, nay, hourly, and the scene of its employment, the bosom of their families, would, of itself, be sufficient to degrade a whole people. Politeness, or gentleness of mind or manners, on the part of the men, are utterly inconsistent with such barbarous treatment of the women. We may, therefore, without fear of error, conclude that the Arabs deserve not, on this head, the praise which has been somewhat lavishly bestowed on them.

Having now, as far as our limits will permit, given a general view of the situation of the Arab people at the time of Mahomet's appearance, we shall proceed to relate the history of the Prophet himself. With this view before us, we shall be able more easily to understand the several circumstances of his life; more correctly to judge of his abilities and his character. Knowing the people, among whom he arose—their state of civilisation, their manners, and their laws, we can, without much difficulty, discover whether he were superior to his age, and whether he advanced or retarded the improvement of his countrymen.

SECT. II.—A description of the sources from whence our knowledge concerning Mahomet is derived is, however, another necessary preliminary to the history of his life: an historian can hardly render a more important service to his readers than clearly to point out the evidence upon which his statements are founded.

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[*] Gibbon, Decl. and Fall, c. 50, p. 89. See also Niebuhr, c. 107, p. 144, for a story of Arab vengeance and brutality.

[†] Koran, c. 4, p. 101.

[‡] Prel. Disc., p. 178. Husbands seem to have felt little compunction at repudiating their wives, with or without a pretext. Hassan, the son of Mahomet, considered a good man by his countrymen, "though his wives were all of them remarkably fond of him, was yet apt very frequently to divorce them, and marry new ones."—(Ockley's Hist. of the Saracens, vol. ii., p. 105, ed. 1718.) Nothing could mark a more complete recklessness concerning the happiness of women.

[§] Sale, Prel. Dis., p. 183.

[*] Ockley's Hist. of Sarac., p. 21. He adds, in a note, "It seems to have been a custom among the Arabs for a bridegroom to make a present to the father of the bride." Among the ancient Germans, also, the custom was prevalent.—(Tac. Germ.)

[†] See "Mahometism Explained." Translated by Morgan, vol. ii., p. 30.

The writers from whom the world has derived all its present information concerning the life and institutions of Mahomet may be divided into three classes, viz., the Arabian writers themselves; the contemporary Christian writers; and the more profound, liberal, and enlightened scholars of modern days.

1. Some years after the death of Mahomet, his works, supposed to be revelations from the Almighty, were collected and put into their present order by the then reigning Caliph. As the prophet could not write, he employed scribes, who wrote, at his dictation, those revelations of the Divine will, at many different and distant periods of his life. The palm-leaves, skins, and bones, upon which they were transcribed, were thrown without order into a trunk, which, with its contents, was placed in the custody of one of the prophet's numerous wives. Abubeker, who succeeded Mahomet as Caliph, is supposed to have had these important documents copied; and corrected according to the recollection of such of the prophet's followers as had committed to memory his revelations at the different times at which they were delivered. These several documents being then arranged in their present order, the whole collection was denominated the KORAN.

The discourses or revelations of the prophet having almost always been occasioned by the necessities of the moment, constant allusions are made in them to circumstances then occurring; they thus become historical evidence[*].

In addition to these sacred writings of Mahomet himself, a book of TRADITIONS, called the SONNA, was collected, containing those actions and sayings of the prophet not recorded in the Koran. These traditions were gathered from his wives and companions, and are by one great sect of the Mussulmans, viz. the Sonnites, believed to be authentic and of authority equal to the Koran itself[†].

These two books, in so far as they are narrations, may be considered the narrations of *percipient* witnesses; of persons who saw and heard the circumstances and discourses they relate. And these are the only records that pretend to be the evidence of persons actually witnessing the circumstances narrated. The worth of these records as historical documents is dependent on the trustworthiness of those who related, and of those who collected, corrected, and attested them. If these narrators and collectors be unworthy of belief, the Koran and the Sonna are nearly worthless.

Two circumstances powerfully concur to depreciate the trustworthiness of these persons, viz. their interest and their ignorance. That they were deeply interested in their prophet's fame is too obvious to be insisted on. The renown of their prophet reflected on themselves; as that was increased so were they exalted. On the other hand, to be the followers of a fool or knave, was to prove themselves fools or knaves. But their own experience in the case of their prophet himself had taught them that to gloss over folly and knavery, no method was so efficacious as declaring it to be sanctioned by the divinity. The other equally powerful cause of untrustworthiness is their ignorance. Their ignorance and credulity are sufficiently manifested by the stories they have related and believed, and by the consequences they have derived from them. That Mahomet imposed upon many of them is certain, otherwise he could never have succeeded in establishing his pretended religion. But to believe him on the evidence he adduced to be the apostle of God; to put faith in the absurd stories he related; to acquiesce without investigation in the doctrines he promulgated, shows them to have been credulous, ignorant, and careless concerning the opinions they embraced. In any case this carelessness would materially have diminished the worth of their testimony, but utterly destroys it when, as in the present instance, a great degree of firmness was requisite to resist the prevailing torrent, as well as of acuteness and ability to gather evidence by which to detect and expose the imposture. But if so easily deceived, and so deeply interested, in what cases are they worthy of belief? In those where they have no manifest advantage in lying; where the matter to be judged was not above the comprehension of an ignorant barbarian; and where the falsity of the testimony, even of ignorant and interested witnesses, appears more wonderful than the circumstance they relate[*].

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[*] Sale, Pre. Dis. sec. 3. pp. 85, 86. Prideaux, Vie de Mah., pp. 47—61. Mod. Univ. Hist. b. 1. c. 2. p. 308.

[†] Mod. Univ. Hist. b. 1. c. 1. pp. 80, 82, 87. See also Sale, Pre. Dis. Sec. 8. pass.—"The different sects of the Mohammedans may be distinguished into two sorts: those *generally* esteemed orthodox, and those which are esteemed heretical. The former, by a general name, are called Sonnites or Traditionists."

Whatever the Arabian writers of after days have related, they have related on the authority of these traditions. These later historians cannot therefore be adduced as *additional* evidence. They repeat merely what they have heard; and having listened with minds little capable of distinguishing truth from falsehood, they have given implicit faith to every monstrous and improbable story favourable to their false prophet. Bred to be believers in his imposture, they were unfit for the task of examination.

2. The next class of historians are the Christian writers, contemporaries of Mahomet; and they are even less trustworthy than the Arabians themselves. They were equally ignorant, equally bigoted, equally interested, but they were not *percipient* witnesses. This combination of circumstances renders their testimony as untrustworthy as human testimony well can be. Of the Christians who were contemporaries of Mahomet, the Greeks of Constantinople were alone removed one degree from utter barbarism. On these men, such as they were, we must partly depend in describing the original institutions of the Arabian prophet. What merit ought to be ascribed to them may be easily learned. Witchcraft they devoutly believed in; and moreover gravely maintained the miracles of Mahomet to have been actually performed, but performed through the instrumentality of the devil. One thing, and one thing alone can be said in favour of these Greek authorities. Mahomet, during his life, had numerous enemies among his countrymen, who were impelled by their interest and their hatred to collect and spread whatever reports were to his prejudice. Many, doubtless, were invented, some, probably, were true. Whatever they were, the Greeks seized upon them with avidity, and triumphantly recorded the abominations of the impostor. By this means, evidence has been preserved (doubtful evidence indeed) against the prophet which the success of his religion has in his own country completely obliterated. Moreover, whatever these men admit in favour of Mahomet may be pretty confidently relied on: for the good they could decently have denied, would never have been acknowledged.

3. Of the writers of modern days the character is somewhat different. Although feelings of hostility to our Mohammedan brethren still exist, yet the present knowledge of Europe renders it impossible for the same mendacity to pervade the writings of modern as of ancient historians. We have now almost universally ceased to regard our own faith as at all concerned in the estimation that may be formed of the character, opinion, conduct, or religion of Mahomet. As our interests have become less concerned, our judgments have become more impartial. We have learned moreover that the employment of calumny and falsehood in support of any system, however admirable, is neither just nor prudent. This knowledge has been but lately acquired. Prideaux himself, among the most violent and unfavourable of Mahomet's modern historians, admits, "that zealous Christians have foolishly invented fables, for the purpose of bringing the impostor into contempt[*]." In addition to these circumstances in favour of modern writers, is the high degree of excellence to which the knowledge of eastern literature, history, and institutions has now arrived. Our enlightened travellers have explored the vast regions of Asia, from one end to the other; have minutely described the customs of the people, and collected a mass of evidence respecting their various institutions far superior to that which our predecessors possessed. We may now speak with comparative certainty regarding the religious and political institutions of Mahomet. But of Mahomet himself, we must for ever rest contented with a broken and uncertain history. In spite of the researches of modern industry, every thing respecting him must remain involved in considerable obscurity. What is believed, is believed on extremely doubtful evidence. The facts related of him assume no connected form, but evidently appear the transactions of many years distant from one another. They are broken, isolated fragments of history, which cannot correctly be formed into a consecutive narrative. The histories of Mahomet hitherto written do not indeed appear thus disjointed. Historians are apt to confound

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[*] Gagnier acknowledges the traditions of the Koran and the Sonna to be for the most part *Romances!* (Pre. p. 39.) See Mod. Univ. Hist. b. 1. c. 1. p. 80; where an account is given of the *genealogy* of these traditions.

[*] Vie de Mah., p. 57.

matters of inference with matters of fact, what they relate upon testimony, with what they infer as a consequence from that testimony; and where facts are wanting, to insert their own opinions as connecting links to the separate events really recorded. It will be our constant endeavour to keep them apart; to present to the reader's mind the circumstances which tradition has handed down, without mixing them up or confounding them with the conclusions which we and others have drawn from those circumstances. Knowing what depends upon evidence, what on our judgment, the reader will be able to give each its due weight and importance.

Sect. III.—Mahomet was born some time during the sixth century, at the city of Mecca. The precise year of his birth is disputed, and after much learned discussion the matter is left nearly as doubtful as when the dispute began. The most probable opinion, however, seems to be that of Elmacin, an Arabian writer, who, according to Hottinger, has placed his birth A. D. 571; but, according to Reiske, A. D. 572. The precise era of his birth being an unimportant circumstance, we shall dismiss it without further comment[*].

The lineage of the prophet has also been a subject of furious altercation. Interest and blind prejudice both concurred to create and continue the controversy. On the one hand he was degraded to the lowest rank of society, while, on the other, he was exalted above most of his countrymen. The contemporary Christian writers hated the prophet, and wished to render him an object of contempt. To their ignorant and prejudiced minds, to describe him as having sprung from a plebeian race, appeared the most effectual means of rendering him despicable. In the same degree that the Christians believed themselves interested in degrading the Arabian prophet, did the Mahometans feel themselves called upon to exalt him; and their ignorance, equal to that of their adversaries, deemed his pedigree an important consideration. What their interest and vanity counselled, they were not scrupulous in pursuing. An alliance with the great is often deemed an honourable distinction. Next to being great one's self, is to have great connexions. Inasmuch, therefore, as the votaries of Mahomet were deeply interested in enhancing his worth, it is not surprising that they should confer upon him a line of ancestry connected with the most ancient and interesting periods of their history. Ismael was usually supposed to be the founder of their race, and they were accustomed to regard him with reverence almost amounting to devotion. The tribe of Koreish, to which Mahomet belonged, had before the birth of the prophet laid claim to Ismael as their progenitor. This claim arising from the vanity of the tribe was eagerly laid hold of by his pious adherents; and what was before mentioned and maintained through a pardonable ostentation, became a dogma of religion, and was defended with all the fury which bigotry engenders.

Without the assistance of fable, Mahomet was able to vindicate to himself a high lineage among his countrymen. Abdallah, the father of Mahomet, was a younger[*] son of Abdol Motalleb, the son of Hashem. "Hashem," say the authors of the *Modern Universal History*, "succeeded his father Abdal Menaf, in the principality of the Koreish, and consequently in the government of Mecca, and the custody of the Caaba[†]." So far the genealogy of the prophet is supported by authentic history—that he was descended from the princes of his people cannot be denied. This descent from Ismael, Gibbon, after Sale, thus disproves: "Abulfeda and Gagnier describe the popular and approved genealogy of the prophet. At Mecca I would not dispute its authenticity; at Lausanne, I will venture to observe—1st. That, from Ismael to Mahomet, a period of two thousand five hundred years, they reckon thirty instead of seventy-five generations. 2d, That the modern Bedoweens are ignorant of their history, and careless of their pedigree[‡]."

Abdallah, though of high lineage, was

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[*] Those who are curious in such matters, may consult Bayle, art. Mahomet, note B.; and Gibbon, Decl. and Fall, c. 50, where the original authorities are mentioned. Gibbon shrewdly remarks—"While we refine our chronology, it is possible that the illiterate prophet was ignorant of his own age." Niebuhr, in speaking of an Arabian whom he met, says, "He told us that he was above seventy years of age; but his acquaintance affirmed that he was not under ninety. We had observed of the Mussulmans in general however, that they seldom knew their own age exactly. They reckon by the most remarkable incidents in their lives, and say, I was a child when such an event happened, or when such a one was governor of a city." (p. 38.) Gagnier says, that Mahomet was born A. D. 578. A. V. 569., vol. i, p. 71.

[*] Prideaux, Vie de Mah., p. 8, says, he was the eldest. This assertion Sale proves to be erroneous.

[†] Vol. i., p. 10, Mod. Univ.

[‡] Decl. and Fall, c. 50.

possessed of little wealth; and as he died while his son was yet an infant[*], we may easily suppose that little to have been diminished by the rapacity of his kindred. The uncles of Mahomet were numerous and powerful, and as in an age little removed from barbarism the rights of the weak are seldom respected, he was plundered with impunity. "The pagan Arabs used to treat widows and orphans with great injustice, frequently denying them any share in the inheritance of their fathers or their husbands, on pretence that the same ought to be distributed among those only who were able to bear arms; and disposing of the widows, even against their consent, as part of their husbands' possessions[†]." A proof that the orphan Mahomet was no better treated than his neighbours is, that he received out of his father's patrimony no more than five camels, and one Æthiopian slave.

How poor soever Mahomet may have been in worldly goods, his birth was rich in prodigies. We are told with unfeigned belief by his deluded followers that at the moment the favoured infant issued from his mother's womb, a flood of brilliant light also burst forth, and illuminated every part of Syria; the waters of the Lake Sawa disappeared; an earthquake threw down fourteen towers of the King of Persia's palace; the sacred fire of the Persians was extinguished, and all the evil spirits which had formerly inhabited the moon and stars were expelled simultaneously from their celestial abodes. The child itself manifested extraordinary symptoms. He was no sooner born, than he fell upon his face and prayed devoutly,—saying "God is great: *There is only one God, and I am his prophet.*" These stories, extravagant as they appear, were devoutly believed, even during the life of the prophet, and hundreds might have been found, who on their oath would have attested these manifestations of his supernatural gifts.[‡] Even in later days, when the people may be supposed more instructed, it seemed to matter little who worked a wonder, so that there was a wonder to be believed and attested. In the reign of Al Mohdi, the third Calif of Abbas, about one hundred and sixty years after the flight of Mahomet, "Hakem, or Al Mokanna, made a great many proselytes at Nakshat and Kash, by deluding the people with several juggling performances, which they swallowed for miracles; and particularly by causing the appearance of a moon to rise out of a well for many nights together."[*] Unlike the contemporary Christian writers, who sincerely believed many of these wonderful circumstances, and with ignorant simplicity ascribed them to the devil, the better instructed observer of modern days would consider it more likely that the ignorant should have been deceived, and the interested dishonest, than that nature should have been turned from her course, and her laws suspended for the gratification of evil demons.

The child thus magnificently favoured was nevertheless exposed to the miseries of want, and reduced to receive his education and subsistence from the charity of his uncle. At the early age of six years he lost his mother, Amena; and two years after, his grandfather Abdol Motalleb, who when dying earnestly confided the helpless orphan to the care of Abu Taleb, the eldest of his sons, and the successor to his authority. From him, though treated with kindness, Mahomet received a scanty education; but whether that education was equal or inferior to that of his countrymen, it is not easy to discover. Tradition states that at the time of Mahomet's first declaration concerning his mission, only one man in Mecca could write. If so, it is nothing wonderful that Mahomet, like the rest of his kindred, should also be unable to write[†].

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[*] According to some authorities, he died before the birth of his son. Gagnier says *after* (Vie de Mah., p. 84.) Abulpharagius states, that the father died two, the mother six, years after his birth. (Pocock's Trans., p. 6.)

[†] Sale, Prel. Disc., p. 183.

[‡] Gagnier, Vie de Mah. pp. 77—83. These different prodigies are said to have been reported by the prophet's mother. Among the instances of credulity or dishonesty of the eye-witnesses of Mahomet's miracles, the following is a curious specimen. Ali, surnamed the Lion of God, was said to have torn from its hinges the gate of a fortress, and used it for a buckler. Abu Rafe, the servant of Mahomet, is said to affirm, that he himself, and seven others, afterwards tried, without success, to move the same gate from the ground. Abulfeda, p. 90. Abu Rafe was an eye-witness, but who will be witness for Abu Rafe?—Gibbon's Dec. and Fall. c. 50.

[*] Sale's Pre. Disc. p. 241.

[†] The story nevertheless seems improbable. It appears (Mod. Univ. His., b. 1. p. 246) that Ebu Ali Taleb, the son of Abu Taleb, and the cousin of Mahomet, was one of the prophet's scribes. How did it happen that Abu Taleb was able to have his son taught, and not his nephew? The number of the prophet's scribes proves the art of writing to have been no extraordinary acquirement. At Medina the art was common; and as there seems to have been a constant communication between that city and Mecca, it appears incredible that so useful a piece of knowledge should not have been communicated from one to the other. Mecca being also a place of

Of the infancy, childhood, and youth of Mahomet, we know almost nothing. The blank in his history has, indeed, been supplied by fable—fable, created by the pious reverence of his followers. Wonderful stories of his wit, and of his favour with the Almighty, are lavishly recorded by the Arab historians. They are, moreover, as well attested as such stories usually are; the impartial historian, nevertheless, has but one course to pursue, viz., to reject them. It is more probable that the witnesses were false swearers, or confiding dupes, than that such tales should be true. Being destined by his uncle to the profession of a merchant, it is probable that his early life was passed in acquiring the knowledge then thought necessary to that profession. Concerning this point, however, we have not one particle of evidence. At thirteen years of age, indeed, he is said to have made a voyage to Syria, in the caravan of his uncle, and, some years after, to have performed the same journey in the capacity of factor to his mistress Cadijah*. On this simple circumstance his friends and his enemies have not failed to engraft a monstrous mass of absurdity and fable. Tradition states, that at Damascus he met with a Nestorian monk, from whom he derived important information respecting his future conduct in propagating his new religion. To believe that a child of thirteen, or a youth of twenty (for he could have been little more even during his second voyage,) had conceived the idea of a new religion, and formed a plan for propagating it, argues credulity that would appear utterly impossible, did we not know that no opinion, however extravagant, is rejected, when a suitable motive is held out to believe it. The early Christian historians of Mahomet's actions were desirous of stripping the impostor of every particle of worth. His religion was not only imputed to him as the most heinous of sins, but whatever applause might be his due, for the composition of the Koran, was to be transferred to another; and a Christian monk was thought the most eligible person to receive the honour. The Arabians preserved an absurd tradition, concerning a prophecy by a monk of Damascus, relative to the future greatness and virtue of the prophet. "When he (Mahomet) arrived at Bosra, a certain learned monk, whose name was Bohira, came out of his cell, pressed through the middle of the crowd, and, seizing his hand, exclaimed, 'There will be something wonderful in this boy; his fame will spread through the East and West; for, when he approached, he appeared covered with a cloud*.'" This pious tale, which possibly the faithful Mussulman devoutly believed, and related, for the honour of his prophet, has formed the groundwork for a story equally incredible, invented for the purpose of depreciating his merits; this being the monk, who is said to have instructed Mahomet in the doctrines of the Christian religion; to have laid a plan, in concert with the future impostor, for creating a new religion, which plan was not to be carried into execution till twenty years afterwards; and to have also composed the most valuable portion of the Koran. When Mahomet performed his first journey to Syria, with his uncle's caravan, he was, according to the best authorities, not above thirteen. His second was accomplished some time previous to his marriage (he married at five and twenty,) and, during this latter journey, he acted as factor for his mistress Cadijah, conveying her goods to the fairs of Bosra and Damascus. During both journies he was ignorant of the Syrian language; both journies were journies of business; the time spent on them was, of necessity, exceedingly short; little, therefore, could have been afforded either to learn the language or converse with the inhabitants. Whatever merit there may be in the composition of the Koran (and assuredly it is exceedingly small,) it cannot, on this evidence, be transferred to the monk Bohira†.

There was no need, however, for an improbable fiction to account for the knowledge which Mahomet possessed, even supposing that necessity would not have taught him all that the Koran

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traffic, the merchants must have hourly felt the want of some mode of recording their transactions. We suspect that the desire of saving their prophet from the accusation of being more ignorant than his countrymen has given rise to the above-stated tradition. Mahomet, in the Koran (c. 2. p. 52), commands all bonds to be made in writing; this could not have been done if writing had been an uncommon art. It is said, however, that a kinsman of Cadijah, Mahomet's wife, taught the prophet's scribes the Hebrew character. (Pocock's notes to Abulpharagius, p. 157.)

* Gagnier, b. i., c. 1, p. 94.

* Abulpharagius, Pocock's Trans., p. 9.

† This monk had many names. Caab and Sergius were among his other cognomens. See Bayle, Art. Mah., note V.

established. "Though the Jews," says Sale, "were an inconsiderable and despised people in other parts of the world, yet in Arabia, whither many of them had fled from the destruction of Jerusalem, they grew very powerful, several tribes and princes embracing their religion; which made Mahomet at first show great regard for them, adopting many of their opinions, doctrines, and customs; thereby to draw them, if possible, into his interests." From the same excellent authority, we learn the Arab Christians to have been exceedingly numerous, and greatly given to heresies; some of them, indeed, going so far as to believe "that the soul died with the body, and was to be raised again with it, at the last day*." They appear, moreover, to have delighted in disputations, and to have given birth to the heresies of Ebion, Beryllus, the Collyridians, and the Nazaræans†. This diversity of sects is evidence of a general knowledge of the Christian faith. "The Jews and Christians were people of the *book;* the bible was already translated into the Arabic language, and the volume of the Old Testament was accepted by the concord of these implacable enemies‡." These circumstances sufficiently account for Mahomet's knowledge of the Jewish and Christian religion.

The next remarkable event in the life of Mahomet is his appearance in the character of a soldier. At the early age of fourteen§, he served under his uncle, who commanded the troops of his tribe, the Koreish, in their wars against the rival tribes of Kenan and Hawazan. The circumstance is worthy of remark, as illustrative of an observation we made in a former section, upon the perfect compatibility between the business of a merchant and that of a soldier, amongst the Arabian people, and upon the constant and rapid transition from one to the other.

By the assistance of his uncle he became soon after the factor of a rich trading widow in his native city. The animosity of his enemies has degraded the confidential agent into a driver of camels. It has been confidently and constantly asserted, that he was a menial servant in the household of his mistress, Cadijah; while, in truth, he was employed to carry on her mercantile transactions and to superintend her affairs. Two things are deserving of observation in this falsification of history: the one, the proof it affords of the utter worthlessness of the Greek Christians as historical guides; and the second, the no less convincing evidence it furnishes of their incapacity for correctly estimating the moral worth of any human being, since the humbleness of a man's employment is by them adduced as a circumstance of moral degradation. In this situation of factor, his conduct and integrity gained him the affections of his mistress. Cadijah was not in the eyes of her people degraded by an alliance with the grandson of their prince; and in her own estimation, by bestowing her hand and fortune upon Mahomet, she gained a young, handsome, and affectionate husband. Twenty years of constancy, of kind and respectful attention, on the part of Mahomet, fully justified her choice. It may indeed be imagined, and we confess the supposition bears the appearance of some plausibility, that the affection of Cadijah was not uninfluenced by the handsome person and insinuating eloquence of her youthful suitor. And we cannot refuse our applause to the conduct of Mahomet, who, whatever might have been her motives, never afterwards forgot the benefits he had received from his benefactress, never made her repent having so bestowed her affection, or grieve at having placed her fortune and her person at his absolute disposal. Cadijah, at the time of her marriage, was forty; Mahomet, twenty-five years of age*. Till the age of sixty-four years, when she died, did Cadijah enjoy the undivided affection of her husband; "in a country where polygamy was allowed, the pride or tenderness of the venerable matron was never insulted by the society of a rival. After her death he placed her in the rank of the four perfect women; with the sister of Moses, the mother of Jesus, and Fatima, the best beloved of his daughters. 'Was she not old?' said Ayesha,† with the insolence of a blooming beauty; 'has not God given you a better in her place?'—'No, by God!' said Mahomet, with an effusion of honest gratitude, 'there never can be a better! She believed in me, when men despised me;

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[*] Sale, Prel. Disc., sec. 2, pp. 46, 45.

[†] Idem. Ibid.

[‡] Gibbon, Decl. and Fall, c. 50.

[§] Prideaux says twenty, Gagnier also, Abulfeda fifteen.

[*] Prideaux says twenty-eight, Abulpharagius the age mentioned in the text. Pocock's Trans., p. 9.

[†] One of his wives, married after the death of Cadijah.

she relieved my wants, when I was poor and persecuted by the world[*].'"

Commerce now occupied his attention, and till the age of forty nothing remarkable happened in the life of the future prophet[†]. His marriage with Cadijah raised him to an equality with the first citizens of Mecca, gave an importance to his opinions, and, combined with the power of his family, probably rendered it impossible to punish or interrupt the first steps he made towards the propagation of his new religion. When relieved from the pressures of indigence, his mind seems almost immediately to have been turned towards religious meditation[‡]. The result of this meditation was an opinion exceedingly unfavourable to the religion of his countrymen. The first statement of this conviction was met rather by ridicule than anger, being considered the phantasy of a dreaming enthusiast, who was little to be dreaded, and unworthy of opposition[§]. We are told that he retired to a cave in Mount Hara, near Mecca, where, as he assured his first proselyte, his wife, he regularly received the visits of the angel Gabriel. Retiring to solitude has been a common custom with religious enthusiasts. At a distance from the distractions of men, they profess to be able to contemplate more intently the works of the Divinity, and to dedicate themselves more completely to his holy service. Enthusiasts, also, have often fancied themselves favoured by visions; to have had converse with spiritual beings; and to have received comfort and instruction at their hands. The artful impostor, however, who endeavours to palm himself upon the world as one of these pious and self-immolated victims, does not fail to imitate their conduct. To distinguish the madman from the impostor, is almost beyond the power of human investigation. Whether Mahomet at this period of his life were an impostor has often been discussed, and the question usually decided according to the pre-existing leanings of the disputants—they who are inclined to look favourably upon him, deeming him a deluded enthusiast, while his enemies have denounced him as an impostor: the latter advancing in favour of their opinion, the intrinsic absurdity of the thing itself; as also his after conduct, which bore evident marks of being dictated by interest and not by enthusiasm. Had he commenced an enthusiast, say they, he would have continued one. Those, however, who have looked with more favour on the prophet, allege the many otherwise good and wise men who have fancied themselves divinely inspired. A heated imagination is by no means uncommon; and an ignorant man finds no readier dupe than himself. Moreover, to bear up against the contumely and indignation of one's fellow-citizens, to brave imprisonment, the loss of fortune and life, requires a determination that few things except an honest conviction are likely to inspire[*]. Neither do they allow that he who was an impostor necessarily commenced one. The temptation to preserve a power unexpectedly obtained may be too strong for the honesty of a man, whom adversity, in its most appalling shapes, cannot compel to swerve from the honest path. Mahomet, in the cave of Hara, the persecuted preacher of a despised religion, might have been a deluded enthusiast, though on the throne of Arabia he was a cunning and consummate politician. Between these contending probabilities who shall determine?

The pretended visits of the angel Gabriel, however, seemed to have been followed by no results worthy of so splendid a messenger. The information which Mahomet affirmed that he derived from his heavenly visitant might, as far as regarded its utility, have been obtained through the instrumentality of a much more humble personage. On the night of the 23d of *Ramadan*, called in the Koran the night of Al Kadr, or the *divine decree*, the KORAN first descended from the seventh to the lowest heaven; and at a distance from the pious Mahomet appeared the brilliant form of the messenger of God, the angel Gabriel, who came to communicate the happy tidings. The light issuing from his body was too bright for the mortal eyes of the prophet; he fainted, and not till the angelic visitant had assumed a human form could he venture to approach or look on him. The angel then cried aloud, "O! MAHOMET, THOU ART THE APOSTLE OF GOD, AND I AM THE ANGEL GABRIEL." "Read," continued the angel; the illiterate prophet declared that he was unable to read. "Read!" Gabriel again exclaimed, "read, in the name of the Lord, who hath created all things; *who hath created man of congealed blood;* who hath taught the use of the pen; who teacheth man that which he knoweth not." The prophet read the joyful and mysterious tidings respecting his ministry on earth, when the angel, having accomplished his mission, slowly and majestically ascending into heaven, gradually disappeared from his wondering gaze[*]. This tale was by Mahomet related to his wife, who believed, or affected to believe, the sacred fable[†]. The next on the list of true believers were Zeid, the servant of the prophet, and ALI, the son of his uncle Abu Taleb. The impetuous youth, disdaining his two predecessors in the true faith, proudly styled himself the first of believers. The next and most important convert was Abubeker, a powerful citizen of Mecca, by whose influence a number of persons possessing great authority were induced to profess the religion of Islam. Three years were spent in the arduous task of converting six of these men. They were afterwards his chief companions, and with a few others were the only proselytes to the new religion before it became publicly known[‡].

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[*] Gibbon, Decl. and Fall, c. 50, p. 151.

[†] Mod. Univ. Hist., b. i., c. 1, p. 31. Gagnier, Vie de Mah., b. i., c. 6, p. 103.

[‡] Gagnier, b. i., c. 6, p. 104. The story of his fainting fits at this period of his life, and of his turning them to his profit by declaring them trances, in which he enjoyed the company of the Divinity, Gagnier asserts to be a fable invented by the earlier Christian writers.

[§] Mod. Univ. Hist., b. i., c. 1, p. 42, and the original authorities there quoted.

[*] It must be remembered that suffering for an opinion is no proof of its *truth*; but is merely some evidence that he who suffers honestly believes that which he professes to believe.

The mission of Mahomet had hitherto been secret, the time was now arrived at which the Lord commanded him to make it known[§]. To this end he convened a large number of his kindred to a feast; forty of whom assembled round his board. The prophet rose, and thus addressed his wondering kindred:—"I know no man in the whole peninsula of the Arabs, who can propose to his relations any thing more excellent, than what I now do to you. God Almighty hath commanded me to call you unto him; who, therefore, among you will be my vizir, or assistant, and become my brother and vicegerent?" General astonishment kept the assembly silent; none offered to accept the proffered office, till the impetuous Ali burst forth, and declared that he would be the brother and assistant of the prophet. "I," said he, "O prophet of God, will be thy vizir; I myself will beat out the teeth, pull out the eyes, rip open the bellies, and cut off the legs, of all those who shall dare to oppose thee." The prophet caught the young proselyte in his arms, exclaiming, "This is my brother, my deputy, my successor; shew yourselves obedient unto him." At which apparently extravagant command, the assembly broke up in confusion, testifying their mirth and astonishment by bursts of laughter[*].

Not discouraged by the failure of this his first public attempt, Mahomet began now to preach openly before the people. He discovered to them that he was commissioned by the Almighty to be his prophet on the earth, to assert the unity of the Divine Being, to denounce the worship of images, to recall the people to the true and only religion, to bear the tidings of paradise to the believing, and to threaten the deaf and unbelieving with the terrible vengeance of the Lord[†]. His denunciations were efficacious; as they were well fitted for the imaginations of an ignorant people. "Because he is an adversary to our signs, I will afflict him with grievous calamities; for he hath devised contumelious expressions to ridicule the Koran—may he be cursed. How maliciously hath he prepared the same!—may he be cursed. I will cast him to be burned in hell. And what shall make thee understand what hell is? It leaveth not any thing unconsumed, neither doth it suffer any thing to escape; it scorcheth men's flesh: over the same are nineteen angels appointed. We have appointed none but angels to preside over hell-fire." . . . . . . "Verily, we have prepared for the unbelievers chains, and collars, and burning fire." . . . . . "Verily, those who disbelieve our signs, we will surely cast out to be broiled in hell-fire: and when their skins shall be well burned, we will give them other skins in exchange, that they may taste the sharper torment[‡]." These terrible sufferings were to be the lot of the wicked—the wicked were those whom Mahomet disliked. "Those who dwell in gardens, *i.e.* paradise, shall ask one another questions concerning the wicked, and shall ask the wicked themselves, saying, what hath brought you into hell? They shall answer, we were not of those who were constant in prayer; neither did we feed the poor; *and we waded in vain disputes*, with the fallacious reasoners; and we denied the day of judgment, till death overtook us: and the intercession of interceders shall not avail them. What aileth them, therefore, that they turn aside from the admonition of the KORAN? [*]" To deny the efficacy of the Koran; to dispute upon the truth and reasonableness of his mission, were naturally in Mahomet's eyes the most heinous sins. By his friendly voice the people were warned of the dangers of disbelief; and besought by his moving eloquence to avoid eternal damnation, by putting faith in the APOSTLE OF GOD.

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[*] Mod. Univ. Hist., b. i., c. 1. p. 44. Gagnier, b. i., c. 7, p. 104—109. Koran, c. 96.

[†] Bayle, art. Mahomet. Gagnier, b. i., c. 8.

[‡] Sale, Prel. Disc., p. 57.

[§] God commanded "him to arise, and preach, and magnify the Lord." Koran, c. 74. Gagnier, b. i, c. 8, pp. 112, 119.

[*] Sale, Pre. Disc., s. 2, p. 57. Mod. Univ. Hist. b. 1, c. 1, p. 47.

[†] Koran, c. 78, p. 472, Sale's trans.

[‡] Koran, c. 74, p. 470, c. 76, p. 474, and c. 4, p. 10.

Among the most strange of Mahomet's stories promulgated at this period of his life, was the tale of his admission into the seven heavens, under the guidance of the angel Gabriel; through whose care and diligence he had been enabled in the course of one night to behold all the wonders of the heavenly regions, and to converse with the Almighty himself. The account which tradition has handed down of this extravagant fable is a tissue of the most dull and ridiculous absurdities; a story, in short, as destitute of fancy as of skill. We may easily suppose that a man of a poetic imagination could have composed a description of a journey through the boundless and glorious regions of heaven, captivating and misleading the minds of his hearers, by its splendid imagery, its gorgeous and startling embellishments. We may conceive him to have possessed them with vague and indefinite, but still with vast and wondering, conceptions of the magnificence of the celestial kingdom; of the power and beauty of its inhabitants; of its own dazzling and unspeakable glories. A well managed description, of such a character, might have had a powerful effect upon a rude and sensitive people. But the description which tradition has handed down, as given by Mahomet of his celestial journey, possesses no such poetical merits. He has described every thing upon a most extravagant scale; but unwisely endeavours to convey *definite* conceptions of the marvels he pretended to have witnessed. He relates by rule and measure, leaving nothing to the imaginations of his hearers. —This was so long—that so broad—this had so many eyes—this so many tongues; —and while he thus strives to swell the imagination by mere arithmetic, he renders himself and his description ridiculous. In the first heaven he saw a cock so large that his head reached to the second heaven, which was at the distance of five hundred days' journey, according to the common rate of travelling on earth; his wings were large in proportion to his height, and were decked with carbuncles and pearls; he crows so loud every morning, that all the creatures on earth, except men and fairies, hear the tremendous sound. The second heaven was all of gold; and one of the angels who inhabited it was so large, that the distance between his eyes was equal to the length of seventy thousand days' journey. In the seventh heaven was an angel having seventy thousand heads, in every head seventy thousand mouths, in every mouth seventy thousand tongues, in every tongue seventy thousand voices, with which day and night he was incessantly praising the Lord. Such were the puerile conceptions of the prophet! Of this famous journey we shall give no further account; a more stupid fable it is impossible to conceive; and which, were it not evidence, would have deserved no mention by the historian. It satisfactorily proves three things, however, the poverty of the prophet's invention; the unbounded extent of his impudence; and the extraordinary credulity of his followers.

The fable at first met with no favourable reception; its extravagance and its absurdity were a little too glaring to be immediately, and without trouble, acquiesced in. Not till Abubeker had declared his complete and implicit reliance in the truth of the sacred fable, did the votaries of the prophet venture to distrust their understandings, and put faith in the astounding assertions of the holy man. Their faith was doubtless quickened by his furious denunciations of eternal torments against all who dared to disbelieve the sublime and miraculous adventure: terror was the result of these denunciations, proclaimed with vehemence and unblushing effrontery; and belief naturally followed in the train of terror. And thus the extravagant lie, which at first threatened the rising religion with early destruction, served, by a happy combination of circumstances, to contribute materially to its success [*].

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[*] Koran, c. 74, p. 471.

[*] They who desire to have a full description of this wonderful tale may consult Gagnier, who is peculiarly minute. Prideaux, moreover, does not let slip the

The apostle, who was at first derided, came at length to be feared. The people flocked to hear his doctrines, and as they retired, wondering and believing, general consternation reigned among the governors of Mecca. Frightened by his growing influence they imprudently endeavoured to arrest the evil, by punishing the offender. For some time, however, the power of Abu Taleb, the prophet's uncle, defended him against these hostile attacks, which served, by manifesting the alarm and hatred of the nobles, to increase Mahomet's fame and importance. Persecution gave him strength, by bringing him before the public. Once known, he gained sympathising listeners among the benevolent, because a persecuted man; and blindly believing votaries among the ignorant and fearful, because a bold and vehement declaimer against wickedness, as well as an eloquent describer of the horrible torments attached to unbelief. In the seventh year of his mission, the heads of the tribe of Koreish made a solemn league with one another, engaging themselves to have no commerce or connexion with the families of Hashem and Al Motalleb. While Abu Taleb lived the league was of no avail; the power of the uncle defended the nephew against the design of his enemies. At length at the end of the seventh year Abu Taleb died; and a few days after his death Mahomet was left a widower, by the decease of Cadijah. In his affliction he termed this fatal year the year of mourning[*].

The unprotected prophet was now completely exposed to the attacks of his enemies. His only safety was in flight, and had not the city of Medina been friendly to his case, the religion of Islam would have been crushed in the bud. The fame of Mahomet, however, had extended far beyond the walls of his native town. Distance, by shrouding him in mystery, increased his influence. While he was scorned at,—derided at Mecca, he was worshipped at Medina[*]. A secret deputation from the city of Medina waited on the apostle, and an alliance was entered into "during two secret and nocturnal interviews, on a hill in the suburbs of Mecca[†]." Seventy-three men, and two women, having professed the faith of Islam, as well as some yet unbelievers, met the prophet and proffered him assistance. "What recompense," said they, "have we to expect should we fall in your defence?" "PARADISE," exclaimed the confident apostle. They promised him fidelity and allegiance.

Abu Sophyân succeeded Abu Taleb in the government of Mecca. In him Mahomet found a mortal enemy to his family, his religion, and himself. The idols, against which Mahomet had preached, were, by Abu Sophyân, devoutly revered; and the new religion abhorred as an incentive to the most horrible sacrilege. No sooner was he called to the head of the state than he determined to exterminate both the apostle and his religion. A council of the hostile Koreish was convened, and the death of Mahomet decided[‡]. The prophet declared that the angel Gabriel had revealed to him the atrocious conspiracy. We may safely suppose, nevertheless, that a human spy revealed the secret. However obtained, the information determined Mahomet to seek safety in flight; but so closely was he watched by his enemies, that he escaped only through the devoted zeal of Ali, who, wrapped in the green mantle of the apostle, lay down upon his bed and deceived the assassins, who besieged the house of his friend. Our applause is due to the intrepidity of the youthful zealot, even though he was zealous in favour of error. He who is willing to offer up his life in defence of the principles he deems correct, has made one important step towards being a perfect character; he has the *will* even if he have not the *knowledge* to be virtuous. Mahomet, in the mean time, with his faithful friend, Abubeker, escaped to the cave of Thor, three miles from Mecca, and there hid himself three days from his pursuers. A cherished tradition of the Arabs states, that the pursuers having arrived at the mouth of the cave, were deceived by the nest of a pigeon

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opportunity of dealing in the marvellous, and of abusing the prophet. The ridiculous stories which Mahomet coined for himself have not been considered sufficient. Some persons, probably the Greek Christians, forged a host of others; among which, that of a pigeon being always seated on the prophet's shoulder, and communicating to him past, present, and coming evils, holds a conspicuous station. To this Pope alludes in the line—

> "Nay, Mahomet, the pigeon at thine ear."
> DUNCIAD.

See Bayle, Art. Mahomet, rem. v.; and Pocock, not. in Spec. Arab. p. 186.

[*] Sale, Pre., Dis. sec. 2, p. 60. Abulfeda, p. 28.

[*] Mod. Univ. Hist., b. 1, c. 1, p. 84.

[†] Gibbon, Dec. and Fall, c. 50. Sale, Pre. Dis., s. 2, p. 63. Abulfeda, Vit. Moh. p. 40.

[‡] D'Herbelot, Bib. Orien., p. 445.

made at its entrance, and by a web which a spider had fortunately woven across it; believing these to be sufficient evidence that no human being was within, they desisted from all further examination. Mahomet and Abubeker left the cave upon the departure of their enemies, and after a toilsome journey, arrived in safety at the friendly city of Medina. This flight of their prophet has become the Mussulmans' æra, the well known *Hejdira* of the Mohammedan nations[*].

From a fugitive Mahomet became a monarch; no sooner had he arrived at Medina, than he found himself at the head of an army devoted to his person, obedient to his will, and blind believers in his holy office. The *fugitives* from Mecca, and the *auxiliaries* of Medina, (the two parties into which Mahomet's followers were now divided) gathered round their chief, and with friendly emulation vied with each other in obedience and in valour. To prevent all jealousy between the brethren, Mahomet wisely gave each one a friend and companion from the rival band; each *fugitive* had for his brother one of the *auxiliaries*. Their fraternity was continued in peace and in war, and during the life of the prophet their union was undisturbed by the voice of discord.

The first act of Mahomet after his arrival at Medina shows at least his policy, perhaps his devotion. He built a temple in which he might celebrate the offices of his religion, and publicly pray and preach before the people. The land upon which this temple or mosque was built belonged to two orphans; and the enemies of Mahomet have not failed to assert that he despoiled the helpless children of their property. The accusation, however, has been vehemently denied, and we cannot but, feel that in a stranger, in one depending entirely upon public estimation for his defence, it would have been the height of impolicy to have committed such an act at such a time. That Mahomet was a deep politician, no one has doubted; that to have robbed two orphans of their property would have rendered him and his religion unpopular is, we think, equally indisputable. How then can we believe him to have erred so egregiously at so critical a moment[†]?

He now, in his own person, combined both the temporal and religious power; he was general of his armies, the judge of his people, and the religious pastor of his flock[*]. And so intense was the devotion of his followers, that his spittle, a hair that dropped from his person, the water in which he washed himself, were all carefully collected and preserved as partaking of the apostle's holy virtue. The deputy of the city of Mecca beheld with astonishment this blind and devoted obedience and veneration. "I have seen," said he "the Chosroes of Persia, and the Cæsar of Rome, but never did I behold a king among his subjects like Mahomet among his companions."

While the religion of Islam[†] had more to fear than to hope from persecution, the precepts of Mahomet breathed humility and benevolence. "Let there be no violence in religion," was the command of the prophet in Mecca[‡]; but in Medina, when at the head of an army, and able to combat with his enemies, he assumed a widely different tone. "O true believers! take your necessary precaution against your enemies[§], and either go forth to war in separate parties, or go forth all together in a body. . . . Let them, therefore, fight for the religion of God, who part with the present life in exchange for that which is to come; for whosoever fighteth for the religion of God, whether he be slain or victorious, we will surely give him great reward." . . . "And when the months wherein ye are not allowed to attack them, *i. e.* unbelievers, shall be passed, kill the idolaters, wheresoever ye shall find them, and take them prisoners, and besiege them, and lay wait for them in every convenient place[‖]." The commands of the prophet were followed to the letter. The first warlike attempt of the believers was, nevertheless, unsuccessful. Mahomet having learned that a caravan, the property of the hostile Koreish, was on its way from Syria to Mecca, dispatched his uncle, Hamza, with a party of thirty horse to capture it. Hamza, however, discovering the caravan to be guarded by three hundred men, desisted from his hostile enterprise, and returned without the expected booty. On the plain of Beder, Mahomet, at the head of his troops, effaced the shame of this failure. A rich caravan proceeding to Mecca, and guarded by Abu Sophyan, with between thirty and forty men, occasioned the contest. The spies of Mahomet informed him that this rich and apparently easy prey was within his grasp. He advanced with a few followers in pursuit of it; but before he could overtake the unprotected band, Abu Sophyân had sent for a reinforcement from Mecca. A troop, consisting of nine hundred and fifty men, among whom were the chief persons of the city, instantly obeyed the summons. Mahomet was posted between the caravan and the coming succour, being able to oppose to this formidable force no more than three hundred and thirteen soldiers, mounted for the most part on camels; some few (according to some authors, not more than two) being mounted on horses. Undismayed by this disparity of force, Mahomet determined to try the event of a battle, and risk his fortune and perhaps his life upon the contest. The troops were persuaded to engage the superior forces of the enemy, and for the present to abandon the tempting prize of Abu Sophyân's rich caravan. Mahomet animated them by his prayers, and in the name of the Most High promised them certain victory. However assured he might have been of divine assistance, he was careful to let slip no human means of securing success. An entrenchment was made to cover the flank of his troop, and a rivulet flowed past the spot he had chosen for his encampment, and furnished his army with a constant supply of water. When the enemy appeared descending from the hills, Mahomet ordered his soldiers to the attack; but before the armies could engage, three combatants, Ali, Al Hareth, and Hamza, on the side of the *Moslems*, and three of the Koreish, joined in single conflict. The Moslem warriors were victorious, and thus gave to both armies a presage of the coming engagement. The prophet, with Abubeker, at the commencement of the battle, mounted a pulpit, fervently demanding of God the assistance of Gabriel, and three thousand angels [*]; but when his army appeared to waver, he started from his place of prayer, mounted a horse, and flinging a handful of dust into the air, exclaiming, "May their faces be confounded," rushed upon the enemy. Fanaticism rendered his followers invincible; the numerous forces of the Koreish were unable to break the ranks or resist the furious attacks of his confiding soldiers. They fled, leaving seventy of their principal officers dead upon the field, and seventy prisoners in the hands of the enemy[*]. Of the Moslems, only fourteen were slain: the names of the slaughtered warriors have been handed down to posterity, and enrolled among the list of pious martyrs, whom the faithful Mussulman is taught to worship. The victorious army stripped the dead bodies of their enemies, insulted, and threw them into a well. A more convincing proof of their barbarity and ignorance could not have been desired. The child in his anger beats the inanimate object of his displeasure; the savage, equally ignorant, and unable to conceive the lifeless corse wholly destitute of will and consciousness, satisfies his ferocious vengeance, and exercises his brutal ingenuity on the inanimate trunk of his adversary. Only two of the prisoners, however, were sacrificed to the anger of the prophet. Al Nodar, and Okba, at his command, suffered death by the hand of Ali, the remainder were afterwards ransomed by their relations. Part of the caravan was captured, but the greater portion arrived safely at Mecca[†]. The spoils, however, arising from the ransom of the prisoners, and the partial plunder of the caravan, amounted to a considerable sum; the fifth part taken for the prophet's share, being no less than twenty thousand dirhems of silver[‡].

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[*] Hejdira, in Arabic, signifies *flight*. According to most authorities it happened 16th July, A. D. 622. Bayle, art. Mah. Mod. Univ. Hist., b. 1, c. 1, p. 98.

[†] Sale, Pre. Disc., sec. 2, p. 67. Gibbon's Dec. and Fall, c. 50, p. 187. Prideaux, Vie de Mah. p. 86.

[*] Koran, c. 4, p. 107.

[†] Islam. The proper name of the "Mohammedan religion, which signifies the resigning or devoting one's self entirely to God and his service." Sale, Koran, c. 3, p. 57. See also Pre. Dis., s. 4. p. 92. Moslem. Musulman. "The Arabic word is Moslemûna, in the singular Moslem, which the Mohammedans take as a title peculiar to themselves. The Europeans generally write and pronounce it Musulman." (Sale, Kor. c. 2, p. 24.) Both words have the same meaning as Islam, and are derived from the same root.

[‡] Koran, c. 2, p. 48.

[§] This is explained by Sale to mean, be vigilant, and provide yourselves with arms and necessaries. Koran, c. 4, p. 107; and Sale's note.

[‖] Koran, c. 4, pp. 108, 109, c. 9, p. 238. The command to war against the enemies of the faith is repeated in chapters 2, 4, 8, 9, 22, and 47. See also Sale, Pre. Disc., p. 188.

The Moslems now hoped to remain at peace; and for some time their expectations were fulfilled. Tradition says that the disturber of this happy tranquillity was a Jew, the son of Al-Ashraf, by name Caab; who being a poet, deplored in touching verses the unhappy fate of those enemies of Mahomet who fell at the battle of Beder, and had the hardihood to sing his poems to the people within the walls of Medina. Mahomet, when informed of Caab's conduct, exclaimed, "Who will deliver me from the son of Al-Ashraf?" A ready instrument was not wanting: Mohammed, the son of Mosalama, answered, "I, O Apostle of God, will rid you of him." Caab was soon after murdered by Mohammed, while hospitably entertaining one of the assassin's followers. War was immediately renewed *.

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[*] Sale, note *d.* Koran, c. 3, p. 56.

[*] Mod. Univ. Hist., b. 1, c. 1, p. 108.

[†] *Ib.* b. 1, c. 1, sec. 2, p. 110.

[‡] Gibbon's Dec. and Fall, c. 50, p. 132. It would seem that this sum was obtained in a subsequent capture, and not from that of Abu Sophyân's caravan, the greater part of which escaped at the battle of Beder. Mod. Univ. Hist., b. 1, c. 1, sec. 2, p. 118. Dirhem. "A dirhem and a-half weighs a drachm; so that there are twelve to an ounce, weighing eight drachms." D'Herbelot, Bib. Orient. Art. *Dirhem.*

In the next year, the third of the Hejira, the Koreish assembled an army of three thousand men, under the command of Abu Sophyân, and proceeded to besiege the prophet in the city of Medina. Mahomet determined to await the attack within the walls of the city. His former victory, however, had too much elated his troops to allow them to pursue this prudent course. They demanded of the prophet to be led out to battle, and he unwisely yielded to their clamorous supplication. Impelled also by the same ardour that influenced his followers, he unwarily promised them certain victory. The prophetic powers of the Apostle of God were to be estimated by the event. Mahomet in every encounter seems to have manifested in a high degree the talents of a general; his troops were always arranged in the manner best suited to the occasion, and he might fairly assert that he owed his success as much to his own intellect as to the valour of his soldiers. In the present instance, his army, consisting of about one thousand men, was advantageously posted on the declivity of a mountain, near Ohad, four miles from Medina. Three standards were confided each one to a separate tribe, while the great standard was carried before the prophet himself; and a chosen band of fifty archers were stationed in the rear with peremptory orders to remain there, till commanded to the attack by Mahomet himself. The conflict commenced by the Moslems charging down the hill, and breaking through the enemy's ranks. Victory or Paradise was the reward promised by Mahomet to his soldiers, and they strove with frantic enthusiasm to obtain the expected recompense. The line of the enemy was quickly disordered, and an instant and easy victory seemed about to crown the efforts of the Moslem troops. At this moment the archers in the rear, impelled by the hope of plunder, deserted their station, and scattered themselves over the field. Khâled, an experienced general of the Koreish, seized the favourable opportunity; and furiously charging the army of Mahomet on the flank, dispersed their disordered and unguarded flanks, and turned the fate of the day. The soldiers of Mahomet began to give way in every direction; Khâled called aloud that Mahomet was slain, and the rout became general. The prophet endeavoured in vain to rally his broken troops: he fought with desperate valour; exposed his person, where the danger appeared greatest; was wounded in the face by a javelin, had two of his teeth beaten out by a stone, was thrown from his horse, and would inevitably have been slain, but for the determined valour of a few chosen adherents, who rescued him from the throng, and bore him away to a place of safety. The day was utterly lost; seventy of his soldiers were slain, and his reputation was in imminent peril. His followers murmured, and asserted that the will of the Lord had not been revealed to him, since his confident prediction of success had been followed by signal defeat. The prophet threw the blame upon the sins of his people: the anger of the Lord, he said, had fallen upon them, in consequence of their security. The Lord had determined to try who were the true believers, who the faithless. "Did ye imagine that ye should enter Paradise, when as yet God knew not those among you who fought strenuously in his cause; nor knew those who persevered with patience *." By these miserable shifts he endeavoured to excuse the falsity of his prophecy. Abu Sophyân, however, did not pursue his success. Eastern warfare depends upon so many chances, that to account for this strange neglect is impossible. In the east the army that this week is victorious, may by the next be melted away and dispersed. They had not then, and they have not now, any mode of regular warfare. No provision is made for a long and continued plan of operations. A distant end, to be attained by means of a series of many intervening actions, is never conceived by an eastern general. He assembles a number of soldiers, and with

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* Gag. Vie de Mah. pp. 351, 2.

* Koran, c. 3, p. 80.

his tumultuary army hastens to a general conflict. If successful enough to annihilate his enemy by one blow, the object of his enterprise is attained; if not, it must be referred to another and more favourable opportunity. To keep his army in the field, to feed, pay, and clothe them during a year's campaign, seems almost impossible. The different armies of the Arabs were bands hastily summoned on some sudden emergency; impelled by the hope of plunder they readily followed to the field; when defeated of their object, they as readily dispersed.

At the commencement of the next year war was again renewed, and Mahomet was now successful. The mode in which he freed himself from one of his opponents at this period, deserves to be recorded. Being informed that Sophyân the son of Khâled was collecting men for the purpose of attacking him, he ordered Abdo'llah the son of Onaïs surnamed Dhu'l-Malldhrat, that is, *a man ready to undertake anything*, to assassinate Sophyân. Abdo'llah obeyed his prophet's commands, and murdered Sophyân in the valley of Orsa. He immediately returned to Mahomet, who upon hearing the success of his enterprise, gave him in sign of his friendship the cane which he usually carried*.

We have neither space nor inclination to enumerate the various battles fought by Mahomet during the five succeeding years. Suffice it to say, that according to the computation of some authors, no less than twenty-seven expeditions were undertaken, in which he personally commanded; and in which nine pitched battles were fought†. During the same period, he was besieged in Medina, by the implacable Koreish; but, by his own skill, and the bravery of his troops, he repelled all their attacks, and eventually dissolved the confederacy into which they had entered with the neighbouring tribes. In the sixth year of the Hejira, with fourteen hundred men, he meditated what he asserted to be a peaceful pilgrimage to the holy temple of Mecca. Entrance into the city being refused by the people, the prophet, in his anger, determined to force his way. At this critical juncture an ambassador was dispatched from Mecca to demand a peace. The policy of Mahomet induced him to lay aside his determination of assaulting his native city, and to accept the peaceful offers of his countrymen. A truce of ten years was consequently concluded between the prophet and the Koreish.

Two years had hardly elapsed when Mahomet accused the people of Mecca of a breach of their engagement. When a man is really desirous of quarrelling, a pretext is never wanting. He was now strong, and his enemies were weak. His superstitious reverence for the city of his nativity, and for the temple it contained, served also to influence his determination for war. The time since the concluding of the truce had been skilfully employed in seducing the adherents of the Koreish, and converting to his religion the chief citizens of Mecca. With an army of ten thousand men, he marched to besiege it, and no sooner did he appear before the walls, than the city surrendered at discretion. Abu Sophyân, the inveterate enemy of Mahomet and his religion, presented the keys of the city to the conqueror; and yielding to the arguments enforced by the scimitar of the furious Omar, he bowed down before the prophet, and acknowledged him to be the apostle of God. Mahomet, though a conqueror, and an impostor, was not cruel; his anger was directed rather against the gods of his country, than its inhabitants. He destroyed the whole of the idols, but executed no more than three men and two women belonging to the party of his enemies. The chiefs of the Koreish prostrated themselves before him, and earnestly demanded mercy at his hands. "What mercy can you expect from the man whom you have wronged?" exclaimed Mahomet, in reply to their supplication. "We confide in the generosity of our kinsman." "You shall not confide in vain," was the politic, perhaps generous, reply of the impostor. "Be gone; you are safe: you are free." They were thenceforth left unmolested, and places of honour and trust were still confided to their care*.

We have now reached the period at which the religion of Mahomet may be considered to have been permanently settled. The conquest of Mecca and of the Koreish was the signal for the submission of the rest of Arabia†. The events of the prophet's after life cease, therefore, to possess an interest for an European reader. They were, for the most part, merely expeditions undertaken for the purpose of reducing the petty tribes who still resisted his authority; and were all of them eventually successful. The influence and religion of Mahomet continued rapidly to extend: his difficulties were over; and the hour of his prosperity has nothing to instruct or to amuse the general reader. Between the taking of Mecca and the period of his death, not more than three years elapsed. In that short period he had destroyed the idols of Arabia; had extended his conquests to the borders of the Greek and Persian empires; had rendered his name formidable to those once mighty kingdoms; had tried his arms against the disciplined troops of the former, and defeated them in a desperate encounter at Muta. His throne was now firmly established, and an impetus given to the Arabian nations, that in a few years induced them to invade, and enabled them to subdue, a great portion of the globe. India, Persia, the Greek empire, the whole of Asia Minor, Egypt, Barbary, and Spain, were reduced by their victorious arms. And although Mahomet did not live to see such mighty conquests, he laid the first foundations of this wide-spreading dominion, and established over the whole of Arabia, and some parts of Syria, the religion he had founded.

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* Gag. Vie. de Mah. vol. i. p. 374.
† Sale, Pre. Disc. s. 2, p. 68.

* Mod. Univ. Hist. b. 1, c. 1, p. 171.
† Idem, b. 1, c. 1, p. 191.

One year before the taking of Mecca, Mahomet had been poisoned by a Jewish female at Chaibar. From the effects of this poison he is supposed never afterwards to have recovered. Day by day he visibly declined, and at the end of four years after that event, and in the sixty-third year* of his age, it was evident that his life was hastening to a close. Some time previous, he was conscious of the approach of death, and met it with firmness and composure. Till within three days of his end, he regularly performed the service of his church, and preached to his people. "'If there be any man,' said the prophet from the pulpit, 'whom I have unjustly scourged, I submit my own back to the lash of retaliation. Have I aspersed the reputation of any Mussulman? let him proclaim my faults in the face of the congregation. Has any one been despoiled of his goods? the little which I possess shall compensate the interest and principal of the debt.' 'Yes,' replied a voice from the crowd, 'I am entitled to three dramchs of silver.' Mahomet heard the complaint, satisfied the demand, and thanked his creditor that he had accused him in this world rather than at the day of judgment.*" He enfranchised his slaves, and quietly awaited the approach of death. The violence of his fever, however, rendered him delirious, and during one of his paroxysms he demanded pen and ink, to compose or dictate a divine book. Omar, who was watching his dying moments, refused his request, lest the expiring prophet might dictate anything that should supersede the Koran. The traditions of his wives and companions relate that at the hour of his death he maintained the same character he had borne through life. He declared that Gabriel visited him, and respectfully asked permission to separate his soul from his body. The prophet granted his request, and the agonies of death came upon him. The blooming Ayesha, the best beloved of his wives, hung tenderly over her expiring husband; her knee sustained his drooping head as he lay stretched upon the floor; she watched with trembling anxiety his changing countenance, and heard the last broken sounds of his voice. Recovering from a swoon, into which the agony of his pains had thrown him, with a calm and steady gaze, he raised his eyes to heaven, but with faltering accents exclaimed,—"O! God, pardon my sins. Yes, I come among my fellow labourers on high." He then sprinkled his face with water, and quietly expired. At Medina, in the very chamber where he breathed his last, the piety of his votaries deposited his remains, and erected over them a simple and unadorned monument †. Medina, on account of the precious relics of the prophet, has become sacred in the eyes of all Moslem nations, and holds the second place among the cities of the earth. And the pious pilgrim on his way to Mecca increases the worth of his pilgrimage if he turn aside to visit also the city which contains the ashes of Mahomet.

Sect. IV.—With the succeeding revolutions of the Arabian empire our present purpose has no connexion. Our task is finished at the death of Mahomet, and all that now remains for us to perform is to estimate his character.

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* Abulpharagius, Pocock's trans., p. 13.

* Gibbon, c. 50, p. 144.

† Concerning the absurd stories of the hanging coffin of Mahomet we shall say nothing, our space being too precious to be spent in such idle discussions. To those who are desirous of information on this point, we recommend the article Mahomet, in Bayle, note DD. Niebuhr says, "the tomb is of plain mason work, in the form of a chest; and this is all the monument." Travels, c. 68, p. 22. Pink. Coll.

Mahomet found his countrymen living under certain institutions, following a certain code of morals and of law, and professing a certain rude religion. These institutions, through his instrumentality, all underwent a material alteration. Did he by this alteration improve the situation of his countrymen? and if so, to what extent did he improve it? These are the questions by which his worth must be judged; and they can be fully and fairly answered, only when we have carefully examined the institutions he framed as they severally regard the government, the laws, the religion, the morals and the manners of his countrymen. By summing up his excellencies and defects in each and all of these departments, we shall alone be able to estimate the *public* character of the man. His *private* character must be judged by his adherence to those rules of morality which his people adopted, and which his own judgment afterwards approved.

The government of his country Mahomet left as faulty as he found it. Previous to his mission the people had been subject to the sway of powerful nobles, whose dominion was uncontrolled either by established forms of government, or by established laws. The petty despotisms of the nobles were by Mahomet united under one head; but the rude mind of the barbarian was unable to conceive any other means of governing his distant provinces than to delegate his own despotic power to the governors he appointed to rule over them. The separate provinces, therefore, though they now owed obedience to one and the same distant monarch, were, nevertheless, ruled as before, each by its own petty despot. Supported by the authority of a mighty empire, and influenced in his private manners, in his expenditure and in his public conduct, by the example of his sublime original, the petty tyrant lost no particle of his mischievousness; oppression, as before, was the lot of the unfortunate multitude *.

That Mahomet established no other form of administration than the usual despotism of oriental nations, even for the central government, need not excite our astonishment. For although superior to his countrymen in the qualifications requisite to lead and impose upon a barbarous people, he was possessed of little really useful knowledge. He had just arrived at that degree of knowledge which renders a man sensible of the necessity of some government; of some person to lead the armies of his nation in war, and to adjudge their differences in peace; beyond this he had made no advance. He knew not that the same circumstances which render a governor necessary, create also a necessity that some securities should exist against the abuse of power by the governor himself. If he was thus ignorant, his merits as a legislator were of the lowest description; if he were not, he was culpably indifferent.

The glare and pomp of constant victory, and wide-spreading conquests, are too often able to attract the admiration, and to disturb the judgment of the historian. Whenever a nation has been induced to unite its energies, and to direct them to the annoyance and destruction of its neighbours, it is usually thought that its government has of necessity been improved, and its people rendered happy and prosperous. To him, however, who will coolly investigate the causes of a nation's prosperity, war, in every shape, must appear the most tremendous of human miseries. The happiness of a people depends upon means of enjoyment, which, in by far the greater number of cases, are the produce of industry: industry employed in deriving from the soil the productions of nature, and fashioning them for use according to our several wants and desires. But the devastations of war disturb the peaceful vocations of the industrious artisan and agriculturist; its expenses swallow up the produce of their labour; that which ought to be employed in reproduction is thrown away in the maintenance of armies; and while the glory of the nation is increased, while the wreath of victory is, by vulgar admiration, placed upon the brows of its warriors, the people are reduced to starving and the triumphs of the successful general are purchased by the misery of millions. Those who have admired the mighty conquests of the Arab prophet have seldom been at the pains to learn whether the *people* of Arabia were made happy by those conquests, or whether the nations subdued by his victorious arms had *their* welfare increased by having their fields overrun, and their towns destroyed by his ferocious followers. What is usually termed the increased national greatness of Arabia, that is, its increased power of subduing and destroying its neighbours, entitles Mahomet to no respect.

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* A more abominable race of governors never existed than the lieutenants of the Caliphs, who succeeded Mahomet. A history of their cruelties may be found in Ockley's Hist. of the Saracens, vol. ii. reign of Moawiyah I.

KORAN.

The Koran must be considered as the code of laws, religion, and morality, which Mahomet, in his character of legislator, promulgated to the people of Arabia. It contains almost every thing he left behind him in the shape of precept and instruction; and such as it is, was supposed by him, and is still thought by his followers, to comprise all the information that is requisite for the happiness of mankind. "It must be remarked, that, as the Alcoran is among the Mussulmans the only book of law, it consequently comprehends all their civil, and, to speak according to our own phraseology, all their canon law. And as it comprehends also the truths which they ought to believe, it follows that a doctor in the law is, according to them, a doctor in theology, and that the two professions of law and theology are amongst them inseparable.

"This law, upon which is founded all the theology and all the jurisprudence of the Mussulmans, is then comprised in the Koran, in the same manner that the law of the Jews is comprised in the Five Books of Moses *."

When Mahomet first laid claim to divine inspiration, he cunningly contrived to obtain in reality the power of making laws. In name, indeed, he was but the instrument by which the divine decrees were made known to the world. He informed his followers, and they believed him, that in the seventh heaven there had been from everlasting a large table, called the *preserved table*, on which were recorded the commands of the Almighty. From this table a copy had been taken, and conveyed by the angel Gabriel to the lowest heaven, on the night of the *divine decree*. From this copy, as Mahomet's necessities required, fragments were conveyed by inspiration to the prophet, and by him were announced to his followers. As might have been expected, they were connected intimately with Mahomet's immediate interests; were composed for the momentary service; they assumed no regular form; and possessed few of the requisites to a complete and accurate body of laws. These fragments, as we have before stated, were, by the succeeding caliphs, collected into one volume, in the form of the present Koran.

The whole is divided into one hundred and fourteen portions, which may properly be termed *chapters;* and these again into smaller divisions, which may with equal propriety be called *verses.*

There is not the slightest approximation to any thing like design or method in either the larger or the smaller divisions. Neither the time at which they were revealed, nor the matter they contain, was the rule by which they were arranged; they were, in fact, thrown together without order or meaning. The divisions of the chapters also are equally faulty. One verse has seldom any connexion with the preceding; and the same subject is in no case continued for a dozen verses in succession: each one appears an isolated precept or exclamation; the tendency of which it is difficult, the pertinence impossible, to discover.

The first nine titles will convey to the reader a fair conception of the skill in arrangement and nomenclature manifested by the prophet's followers.

1. The Preface. 2. The Cow. 3. The Family of Iram. 4. Women. 5. Table. 6. Cattle. 7. Al Araf. 8. The Spoils. 9. The Declaration of Immunity.

The language of the book, if we may judge by the translations we possess, is by no means superior to its arrangement. The Arabians themselves declare it to be beyond competition. Nothing inferior to the divinity, say they, could have composed such magnificent sentences. Mahomet himself was so convinced of the beauty of his style, that he boldly advanced its perfection as the most striking proof of the authenticity of his mission. "The Koranists, or persons attached to the Koran, find nothing eloquent or excellent out of the Book. They assert that Lebid, one of the most famous poets of the Arabs, became a convert upon the reading of three or four verses of the second chapter, which he believed inimitable in their style. These Koranists are great enemies to the philosophers, particularly to metaphysicians and schoolmen. They condemn both Averroës and Avicenna, the two greatest ornaments of Moslemism; and also Plato and Aristotle*." We suspect, however, that the Arabians are as ignorant of style as of method. Rhapsody is in no place less desirable than in a body of laws. The expression of a law should be precise, clear, complete, and brief. It would be difficult to discover any of these qualities in any portion of the Koran. To an Arabian ear the language may probably possess beauties that none but an Arabian can feel. But these delicate graces of style, though, in poetry, of infinite importance, are of secondary, perhaps, no importance whatever in a book of laws. It is more than probable, also, that even these graces are exaggerated, and that fashion makes an Arabian pretend to feel beauties which in reality he never discovered.

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* D'Herbelot, Bib. Orient. mot Fkh.

RELIGION.

One thing it will be necessary to premise respecting the standard to which we intend to refer the religion of the impostor. The religion of Mahomet, unfortunately for the largest portion of the human race, was not the TRUE RELIGION. As a means of salvation, therefore, it is worse than useless: we know too well that it cannot save men hereafter, we need only inquire if it can possibly make them happier in this life.

On examining the precepts of the Koran, we are astonished how little was either added to or altered by Mahomet in the ancient belief and institutions of the Arabs; and, moreover, we cannot but feel sensible that these alterations and additions were scarcely, if at all, for the better. The religion of Mahomet, as contra-distinguished from that of his countrymen, was marked by three peculiarities: the first was, that he established the worship of a single God; the next, that he set himself up for his inspired minister; the third, that he commanded his followers to propagate their belief by the sword. The first of these, viewed in conjunction with his other doctrines, was little more than a nominal improvement, the two last evidently mischievous.

The wild Indian, who, in the sun, fancies he beholds the sole governor of the universe, and to him alone pays his adoration, believes evidently in a single god; but no one can say that he believes in the only true God. His god is a phantasy, and may be a terrible phantasy. The ignorant savage may fancy him a being endowed, not with mild and merciful, but malignant and revengeful qualities. If to this savage there should come some eloquent but half-instructed philanthropist, who should teach him that, instead of one such terrible Divinity, there were two, whose pleasure was creating happiness not misery; who, in their beneficent solicitude, fashioned this wonderful universe, in order to enjoy the spectacle of a world of happy creatures; can we believe that the religion of the savage would not be improved, though now he should offer up his orisons to two divinities instead of one? Mahomet, in circumscribing the number of the Arabian gods, altered not their character. He left them as he found them—easily irritated, with difficulty appeased; revengeful and capricious; to be propitiated rather by ceremonies than by virtuous actions; more interested in the proper cut of a votary's nails, or in the regular prostrations of his body, than in the happiness he enjoyed himself, or in the conduct he pursued towards others. There were seven things in which the faithful Mussulman was to believe; four things which he was to perform, only one of which was connected with the temporal welfare of himself or his fellows.

1. He was to believe in Mahomet's God; 2. in Mahomet as his prophet; 3. in his angels; 4. in his scriptures; 5. in his prophets; 6. in the resurrection and day of judgment; 7. in God's absolute decree and predetermination of good and evil.

His imposed performances were—1. Prayer, under which were comprehended the washings and purifications; 2. Alms; 3. Fastings; and, 4. Pilgrimages to Mecca*.

"There is no circumstance connected with a religious system more worthy of attention than its morality—than the ideas which it inculcates respecting merit and demerit; purity and impurity, innocence and guilt. If those qualities which render a man amiable, respectable, and useful as a human being; if wisdom, beneficence, self-command, are celebrated as the chief recommendations to the favour of the Almighty; if the production of happiness is steadily and consistently represented as the most acceptable worship of the Creator, no other proof is requisite, that they who framed, and they who understand this religion, have arrived at high and refined notions of an all-perfect Being*." Taking this observation for our standard, it requires little penetration to discover that the conceptions of Mahomet respecting the requisites for a perfect religion, were those of an ignorant barbarian. Throughout the Koran, the greatest possible stress is laid upon the necessity of a belief in Mahomet's pretended mission; all other virtues are useless if this single point of the prophet's divine appointment be not steadily fixed in the mind, and constantly present to the imagination of the aspirant to everlasting life. But while belief in the pretended prophet is thus exalted to the highest point the imagination can conceive, the really useful qualities are placed low down in the scale of importance. The consequence is, that the votary is careless of his conduct so long as he is fortunate enough to preserve a belief of the proper description. The faithful, that is the believing, Mussulman is in no doubt concerning his reception into the heavenly regions, if, while in the minor consideration of virtuous conduct, he might be wanting, he should have strictly followed the ceremonious observances of his religion, and firmly believed in the impostures of his prophet. This assertion is amply borne out by experience. A Mussulman proverb condemns every man as untrustworthy who has performed the pilgrimage to Mecca.

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* D'Herbelot, mot ALCORAN, p. 81.

* Sale, Pre. Disc. sec. 4. p. 93.

That general precepts may be found in the Koran, which, in emphatic language, command men to be virtuous, cannot be denied; but it must be remembered that no legislator ever deliberately, in words, recommended vice. A general command to be virtuous is of little service, and should by no means receive our approbation till we have learned what, in the legislator's opinion, is deemed to be virtuous. The great object of every legislator is to enforce the observance of what he commands; that observance *he* would consider virtue, though he should command his subjects to slay all who wore clothes or professed opinions differing from their own. These vague and general precepts, then, may be considered as neither beneficial nor otherwise: no matter how emphatic, how beautiful may be the language in which they are conveyed. The circumstance really important is the *conduct* which the legislator has enjoined, and to which he has attached the character of virtue. We must learn what acts the legislator considers most acceptable to the Divinity; what acts he recommends to the approbation of mankind. We again quote Mr. Mill.

"If we search a little further, we shall discover, that nations do not differ so much from one another in regard to a knowledge of morality and its obligations (the rules of morality having been taught among nations in a manner remarkably similar), as in the various degrees of steadiness, or the contrary, with which they assign the preference to moral above other acts. Among rude nations it has almost always been found that religion has served to degrade morality by advancing to the place of greatest honour those external performances, or those mental exercises, which more immediately regard the Deity; and with which, of course, he was supposed to be more peculiarly delighted. On no occasion, indeed, has religion obliterated the impressions of morality, of which the rules are the fundamental laws of human society. It has everywhere met with the highest applause, and no where has it been celebrated in more pompous strains than in places where the most contemptible, or the most abominable rites have most effectually been allowed to usurp its honours. It is not so much, therefore, by the mere words in which morality is mentioned, that we are to judge of the mental perfection of different nations, as by the place which it clearly holds in the established scale of meritorious acts *."

From the list of actions we have given, as necessary to a perfect Mussulman, it is obvious that Mahomet established a scale of meritorious acts, in which idle, ridiculous, useless, and sometimes mischievous observances occupy the chief place, while all really useful actions are passed over as unimportant. We need no further proof of the low character both of his religion and his morality.

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* Mill's Hist. of British India, b. 2. c. 6. p. 263.

* Hist. of Brit. India, b. ii., c. 6, pp. 278, 279.

One mischievous portion of his religion must not be forgotten, viz., the command to propagate it by force*. If there be one means more effectual than another of keeping men in perpetual ignorance, and consequent misery, it is to make truth and justice always the portion of the strongest. If, to the settlement of contending opinions, force alone be necessary, it is evident that the correctness of either is a matter of no moment. Consequently to discover whether an opinion be founded in truth will never be the aim of the disputant. The measurement of his own and his adversary's powers, is the circumstance that will concern him; he will be careless concerning the propriety of his belief, so long as his arm is the stronger; and hatred the most violent will arise in his mind against all who do not agree with him, inasmuch as non-accordance with his opinion implies a contempt of his power. He will learn to attach to words and symbols immeasurable importance, for they will be all that he can understand. His mind will be shut against conviction; and turned with implacable animosity against every one who hoists not his standard, or who is not attached to his formula. Every bad passion will be generated in his mind; irascible, impatient of contradiction, and revengeful, he will be ignorant himself, and determined to keep others so; will resist every improvement, as an attack upon his creed, and invariably weigh every man's worth, not by his actions, but by the words of his belief.

The Arabians, before the appearance of Mahomet, were a tolerant people. They forced none to believe as they believed; but lived in harmony and friendship with persons of every persuasion. In the retired cities of Arabia, the Christian, the Jew, and the Pagan, all found a refuge; and not till the persecuting spirit of Islam was established, were they disturbed in their hitherto peaceful abode. Arabia, however, became through Mahomet divided against itself; and to the many already existing causes of dispute were added the direful animosities of religion.

LAW.

Nothing but the prejudices of education could make a reasonable man look upon the Koran as a book of jurisprudence capable of conveying instruction to any but a nation of savages. Deficient in form; deficient in clearness; incomplete, it possesses not one single quality requisite to a body of law. In the midst of a vast farrago of nonsense, hidden amidst unmeaning explanations, and dark mysterious prophecies, there sometimes appears a command respecting the distribution of property, or the punishment of offenders. But no explanations are given—no regular description of the means by which property may be acquired; no enumeration of those by which the rights to it may be lost, is even attempted. The rights of individuals, in their several capacities, to the services of others, are nowhere distinctly mentioned; nor is there any the most distant approximation to a systematic view of the several obligations to which it was intended to subject the members of the community. As occasion prompted, or when a dispute happened, Mahomet was accustomed to issue a revelation, which answered for the immediate purpose. But the original unwritten customs of the Arabs remained in full force, receiving little modification from the decrees of the prophet. One advantage, and one alone, he may be supposed to have originated,—his were *written* decrees; it was a commencement for a body of laws, though a rude and imperfect one. This benefit, however, is more than counterbalanced by the evil of their being irrevocable. What the ignorant barbarian instituted, succeeding generations have been obliged to retain. No matter how absurd, how injurious the decree, religion commands the faithful Moslem to abide by it. The Almighty was its author, and he is all-wise; and, moreover, is as wise at one time as another. How, then, shall we pretend to amend the divine ordination, or fancy that he himself need amend it? The conclusion is irresistible, provided the premises be allowed. The nations who have assumed the Moslem faith have consequently remained, and, while professing it, will remain, barbarians.

Into the particular laws which Mahomet established we do not intend to examine. That many of them were useful cannot be denied; but to establish them argued no great wisdom on his part, whilst the loose and uncertain manner in which they were promulgated shows that he himself attached little importance to their establishment. Succeeding ages have, in some degree, improved upon this rude system of law; but the improvement has been effected by the increasing civilization of the people, which has advanced in spite, not in consequence, of the Koran. As the opinions of the people have become more enlightened, better interpretations have been put upon the sacred volume; it has thus, in appearance, kept pace with the improvement of the people. From the obscure style in which the holy book is written, it is liable to several interpretations; in a barbarous age, a barbarous interpretation was the one chosen; but when succeeding times revolted at these abominable precepts, the interested clergy declared that their predecessors had been mistaken; that the true spirit of the Islam religion and law had been misunderstood. It has nevertheless constantly, and for the most part successfully, withstood all improvement. The amelioration in its tenets has been rare; and has never taken place till the bigoted priesthood foresaw that further opposition would be dangerous.

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* The following saying of Ali raises a vivid conception of the success of Mahomet's preaching on this head: "HOLY WARS are the pillars of religion, and the highways of the happy; and to them who are engaged in them, the gates of heaven shall be open."—(Ockley's Trans. of Ali's Sayings, cxxxi.)

Even from this hasty and imperfect review of Mahomet's actions as a legislator, the reader will be able to form a tolerably correct estimate of his public character. That he was a barbarian, unskilled in the sciences of which he professed himself the inspired teacher, and deserving a very small portion of applause, as having advanced the civilization of his people beyond the point at which he found it, is abundantly manifest: that he was superior to the age in which he lived may be believed from the success of his imposture. Among a people so rude as the Arabs, however, a very slight superiority was sufficient to render him thus successful. His talents contributed to his own fortune, not to his nation's improvement; he was skilled in whatever was necessary for his personal aggrandisement; in whatever was useful to others he was miserably deficient.

Of his private character we need say little. He has usually been branded with opprobrium for not conforming to established rules of morality, of which unhappily he was totally ignorant. For this, assuredly, he deserved no reprehension. That, however, for which he does deserve the severest reprehension, is his departure from the morality which he approved and adopted. The moral code of a people must be judged by its approximation to that perfect standard which provides completely for the happiness of mankind; but the moral character of a particular man must be judged by the steadiness of his adherence to that code which he considers the correct one.

His unbounded gratification of his amorous propensities has been urged as a proof of his immorality. In this, however, he followed the manners of his countrymen: among them it was no crime to maintain as many female slaves and wives as their wealth permitted, and their desires prompted. Mahomet, in acting up to the measure both of one and the other, offended against no rule of morality with which he was acquainted.

Mahomet was a murderer and an impostor. He prompted and approved of the assassination of Sophyân and Caab. It must, however, be recollected that, among the barbarous Arabians, the same carefulness of life was not inculcated as among a civilized people; and the prophet, in getting rid of his enemies, did not outrage the feelings of his friends or his enemies. We cannot, indeed, but detest the morality of a people who tolerated such conduct, and also hold in exceedingly low estimation the civilization of him, who, pretending to improve that morality, upheld and practised the very worst portion of its tenets.

That Mahomet was an impostor cannot be doubted. In the early part of his public life he might have fancied himself somewhat peculiarly gifted; but that his self-delusion should have continued to the later years of his life, to such an extent as to acquit him of fraud, is utterly impossible. His story of the heavenly journey was a fiction, which nothing but absolute madness could have permitted him to believe. Moreover, the constant visits of the angel Gabriel, precisely at the critical moment when his aid was needed, are sufficient evidence of a perfect absence of all self-delusion. But, being an impostor, did he employ the power he acquired to the advantage of his people or to his own aggrandisement? He exalted himself to a throne, and, possibly, when his own interests were not concerned, did, as far as his abilities enabled him, further the welfare of his people. He was not cruel, nor sanguinary: his conquests were generally speaking marked by no butchery*; nor was his government a tyrannical one. In his private life he was mild and gentle; affectionate to his friends and his wives; and just and honourable in his dealings. As a private man, among his own people, he was esteemed virtuous and beneficent. For the most part he wanted rather the knowledge than the will to be an estimable citizen, as well as a beneficent legislator. His vices were the vices of his age; and, as he was little superior in knowledge to the men by whom he was surrounded, it is not wonderful that he did not greatly surpass them in virtue.

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* Like other conquerors, Mahomet was occasionally cruel: he was, nevertheless, as compared with his age and nation, a merciful conqueror.—See, for specimens of his cruelties, Mod. Univ. Hist. b. 1. c. 1. p. 131.

NOTE.

It may be of service to point out to the reader the authorities on this portion of history. In reading to acquire knowledge respecting the fortunes of mankind during any particular period, two objects should be kept in view:—*1st*, to discover what events occurred; *2d*, to learn the manners and institutions of the people whose history we are investigating. A detail of events without a knowledge of the institutions and customs which must materially have influenced those events, is utterly barren of instruction. Under this twofold division we shall therefore class the authors which we are about to recommend. It must be remembered that only such portions of history are here in contemplation, as are requisite to elucidate the life of Mahomet.

I. *Works giving the History of Events.*

1. The first we should recommend is the first chapter of the first book of the Modern Universal History, which as a repertory of facts is valuable. The Arabic scholar could not do better than trace out the Arabian authors there quoted.

2. Chapters 50 and 51 of Gibbon's Decline and Fall. These contain an easy, graceful narrative of the prophet's life and the conquests of his followers, a superficial account of his institutions, and a host of authorities to which the industrious historical reader would do well to refer. In Gibbon, moreover, will be found a clear description of the situation of the Greek empire, and all we know on the subject of Persia during that period.

3. Gagnier's Life of Mahomet contains the fullest account of his fortunes that any writer has left us. Gagnier has written precisely as a Mussulman might have written. He has related all the wonderful stories that the Arabs report of their prophet; and coolly describes every act of atrocity without observation or repugnance.

4. Prideaux will add little to our knowledge, but his book is not long.

5. Ockley's History of the Saracens. A most remarkable and original work, giving a lively picture of the times; containing some good, and many extravagant observations: it well deserves perusal.

6. Pocock's translations will be read by a hardy and determined investigator, but by no other.

These sources will be sufficient; and if more be required, the reader will be able, from the light they afford, to discover the remainder for himself.

II. *Works respecting the Manners, Institutions, &c.*

1. Sale's Koran, and Preliminary Discourse. It would be difficult to find a more excellent authority. He has few prejudices, and relates a great deal. The reader is presented with a copious and candid detail, and is generally left to form his own judgment. Like too many other oriental scholars, however, Sale, was much inclined to overrate the worth of that literature of which he enjoyed a sort of monopoly. His facts may be relied on.

2. Ancient Universal History, vol. xviii. b. iv. c. 21, written by Sale, and containing an excellent account of the laws and customs of the Arabs.

3. Niebuhr's Travels. The best of oriental travellers: he relates honestly, and judges like a philosopher.

4. D'Herbelot. Bibliot. Orientale. Of this work, Gibbon says, "the *Oriental Library* of a Frenchman would instruct the most learned Mufti of the east;" and again, "for the character of the respectable author consult his friend Thevenot (Voyages du Levant, part i. c. 1.) His work is an agreeable miscellany, which must gratify every taste; but I can never digest the alphabetical order, and I find him more satisfactory in the Persian than the Arabic history." (Decline and Fall, c. 51.)

5. Not connected immediately with the present portion of history, but an admirable guide nevertheless in our investigations, is Mill's British India, b. 2. The author of the present work cannot omit this opportunity to acknowledge the great debt he owes to the profound historian of British India.

6. The French writers of the eighteenth century, more particularly of the Encyclopédie, are unsafe guides. Their conclusions are generally well drawn from false data. So with Voltaire.

7. Of the various modern travels into Arabia it is not necessary to speak specifically. They are all amusing, and many of them instructive. Their facts generally can be relied on.

CARDINAL WOLSEY.

Chapter First.

Birth and Parentage of Wolsey.—The Nature of his Early Pursuits.—The Cause of his First Preferment.—His First Transaction in State Affairs.—His Increasing Honours.—Advantages derived by Wolsey from the Events of the War.

Thomas Wolsey was born at Ipswich, in the month of August, and in the year 1471. His father is generally supposed to have been a butcher, but there is no positive authority for the statement. Great unnecessary importance has been attached to this point by those authors who have written upon the character and actions of this celebrated man. It is sufficient to know that Wolsey had the merit of rising from an obscure station; that he was the son of a poor, but honest man; that his parents possessed the means of educating him respectably; but acquired not, happily for him, the wealth to support him idly;[*] yet these humble individuals lived perhaps far more usefully and happily in their obscurity, because more respectable, than their unprincipled illustrious offspring.

It was not until two centuries after the birth of Wolsey that any degree of curiosity concerning his origin was manifested by the public. In 1761, it was ascertained by one of his biographers, that the father of Wolsey possessed some property in land, in two parishes of Ipswich; that he bequeathed to his son, Thomas, ten marks to sing a mass for his soul, if he entered into holy orders within a year after his father's death; that he left his lands at the disposal of his wife, Joan; and the rest of his worldly property to his son, his wife, and another person, "to dispose as they should think best to please Almighty God, and to profit his soul."[*]

At a very early age Wolsey was sent to Magdalen College, Oxford, where he acquired the rare distinction of being a bachelor of arts when he had only reached his fifteenth year. This early honour was remembered by him with the pride and satisfaction with which prosperous men often revert to the first step in their ascent to fame. In his more splendid and wretched days, Wolsey related the circumstance to George Cavendish, one of his gentlemen ushers, who has repeated it in the valuable Memoirs of Wolsey, which he subsequently composed. "He told me, in his own person," says Cavendish, "that he was called the boy bachelor at fifteen years of age; which was a rare thing, and seldom seen." The youthful acquirements of Wolsey, how much soever they may have been admired by his contemporaries, were not of a nature to be highly valued in the present day. The pursuits of a clerical student, in the fifteenth century, were neither adapted to qualify him for offices of state, to which the clergy were, at that time, oftentimes promoted; nor to endow him with the power of reasoning accurately. The Metaphysics, and Natural Philosophy of Aristotle, formerly prohibited, and burned at Paris, by a decree of the Council of Sens, in 1210, had been again received into favour by the schools, chiefly through the exertions of Thomas Aquinas, a theologian of the fourteenth century, employed with other learned men to translate the works of Aristotle from the Greek and Arabic languages, into Latin.[†] In the early part of Wolsey's life the reputation of Aquinas was at its height, and Wolsey imbibed from education a partiality for the doctrines, and an admiration for the talents, of that great man, by which his subsequent opinions on theological subjects were strongly tinctured. Seconded by the zeal and talents of Aquinas, scholastic learning had gained rapidly in public estimation; while the Biblicists, those who resorted to the writings of the ancient fathers, or to Holy Writ itself, as the sources of divine truths, had declined both in numbers and importance. Hence consequences the most injurious to religion and philosophy ensued. The education of youth was directed to attainments of a superficial character; a fluency of argument, calculated to mislead, but not to convince; a readiness in the use of scholastic terms, and in the practice of unintelligible distinctions, and a skill in imparting to disputation the air of method, and the semblance of abstruse reflection,—constituted, long after the death of Aquinas, the chief accomplishments of young theologians.

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[*] In the opinion of Wood, (Athenæ Oxonienses, vol. 2, p. 734,) the assertions respecting the vocation of Wolsey's father being that of a butcher, originated with William Roy, the author of a satire upon Wolsey, entitled "A Dialogue between two Priests' Servants, Watkins and Jeffrey," beginning

"Rede me, and be not wrothe,
For I say no thyng but trothe."

The writers contemporary with Wolsey appear to have known little of his origin. Bishop Godwin, in his Lives of the English Bishops, (p. 618,) speaks of Wolsey "as the son of a poor man, or, (as I have often heard,) a butcher." Skelton, poet-laureate in the time of Henry the Eighth, satirizes Wolsey under the appellation of the "butcher's dog." Hall mentions that the populace abused him as the "butcher's son," a term also applied contemptuously to him by Luther, in his Colloquia. Cavendish describes him as an "honest poor man's son."—See Cavendish, edited by Singer, p. 32.

[*] See the will of Robert Wolsey, in Fiddes's Life of Wolsey. Collections.

[†] Mosheim's Ecclesiastical History, vol. iii. p. 25.

Such being the nature of those studies to which the attention of Wolsey was directed, it is not surprising that he should have contracted strong prejudices, and imbibed erroneous opinions, which even the powers of his vigorous and comprehensive mind were unable to correct. In the endeavour to understand and to retain the subtleties and refined distinctions of his great model, Wolsey neglected both the politer branches of learning, and the important acquisition of real religious knowledge, which can be gained from Scripture alone. In those days, a critical knowledge of the Scriptures was, indeed, rarely to be found even in the most celebrated collegiate teachers, who were usually ignorant of the original languages.[*] Thus, as the historian of Henry the Eighth, Lord Herbert, expresses it, "the learning of Wolsey, which was far from being exact, consisted chiefly in the subtleties of the Thomists, in which he, and King Henry the Eighth, did oftener weary than satisfy one another." To the same cause may be attributed the absence of those higher principles of action, which, had they regulated the conduct of Wolsey, might have rendered his splendid career a source of incalculable benefit to his country.

To pass his days in studious retirement was not, however, the lot of Wolsey, who had the advantage, for such it often proves, of resting entirely upon his own exertions. It must have been an acceptable turn of good fortune to him, after having, by his proficiency in logic and philosophy become a Fellow of Magdalen College, to have been appointed master of the school, in which students, intended to enter that College, were instructed previous to their admission; a practice common at both the Universities,—each College having, in general, some particular school appropriated to it.[*] Luckily for Wolsey, there were, among his pupils, three sons of Grey, Marquis of Dorset, the collateral ancestor of Lady Jane Grey. To these young noblemen Wolsey proved an able and assiduous instructor; and it is a curious reflection, that he, who in after times became the governor of princes, possessed, in this early period of his life, the forbearance and diligence which render the humble, and often thankless, offices of a teacher effectual. Perhaps the opportunity thus afforded to Wolsey of viewing, in the ingenuous soul of youth, the secret springs of action and the varieties of undisguised passion, may have been the first source of that intimate knowledge of character which was ascribed subsequently to necromancy, by his enemies, from the influence which he gained over the king. Whatever may have been the final benefits of the task thus appropriated to Wolsey, the immediate advantages were both encouraging to him, and creditable.

It happened that he was invited, with his pupils, to pass under the roof of their father the pleasant and "honourable feast of Christmas,"[†] in which our forefathers, even more than ourselves, were wont to delight. During this vacation, the marquis had ample opportunities of observing the progress of his sons, and was so highly gratified by their proficiency, that he determined to present their tutor with the living of Lymington in Somersetshire, a benefice in the gift of the Dorset family, and in the diocese of Bath and Wells. This presentation took place at the departure of Wolsey with his pupils from their paternal abode; and it was the more acceptable to Wolsey, on account of some pecuniary embarrassments, of no very creditable nature, in which, according to tradition, he was involved. A statement currently reported either during the life, or shortly after the death of Wolsey, affirmed him to have employed, without authority, various sums taken from the treasury of Magdalen College, of which he was bursar, in the erection of the great tower which was completed at that College during his continuance in office: and he is even said to have used violent means to possess himself of the money necessary for that purpose. The details of this transaction have not, however, reached us, and it seems doubtful if there be any foundation at all for reports so injurious to his reputation. It must, however, be observed, that always painful and often unwise as it is, to draw conclusions unfavourable to the motives and actions of our fellow men, there is no reason to infer from the subsequent conduct of Wolsey that his principles of integrity, in relation to pecuniary affairs, were very exact; or that he would not have sacrificed to ambition, or to any object which he had in view, that sense of honour, without which the greatest qualities can neither redeem the character from meanness, nor save the reputation from dishonour.

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[*] When Luther, many years after the period of Wolsey's youth, challenged the University of Paris to dispute with him upon a Scripture foundation, not a single person could be met with, qualified to argue upon a system which had become nearly obsolete.—Mosheim, vol. iii. p. 298.

[*] See Fosbrooke's Monasticon.

[†] Cavendish's Life of Wolsey, p. 67.

Wolsey obtained his first church preferment in Oct. 30, 1500, when he had attained his twenty-ninth year.* His ordinary deportment partook, in too great a degree, as far as morality was concerned, of the licentiousness in which the clergy of those times, perhaps more than any other class of men, indulged. It is uncertain for what excess Wolsey at this time incurred a chastisement, which he had neither the wisdom to forget, nor the generosity to forgive. The affair, according to tradition, originated thus: Sir Amias Pawlet, a knight and justice of the peace, residing in the neighbourhood, discovered the Rector of Lymington in a state of drunkenness at a fair, and deemed it essential to punish the offender by placing him in the stocks; and the aspiring Wolsey was obliged to endure that ignominious mode of confinement, which the compassion or refinement of our present notions has almost abolished in our villages. A curious specimen of the manners of the times, where a beneficed clergyman could thus be held up to popular derision, is afforded by this incident, which was deeply felt, and long resented by the delinquent. Many years afterwards, when the Chancellor of England had not the liberality to pardon the insult offered to the Rector of Lymington, he sent for the country magistrate, and, after a severe reproof, commanded him to wait within the precincts of the court, until, at the pleasure of the council, he should be allowed to depart. Sir Amias knew how necessary it was in that age of despotism to bend to circumstances; and contrived to appease the Chancellor, in the course of five or six years, by embellishing the exterior of his own house, situate at the gate of the Middle Temple, with the badges and cognizances of Wolsey, and with a Cardinal's hat and arms.*

Upon the death of the Marquis of Dorset, in 1501, the obscurity of a country parsonage, without hope of preferment, becoming intolerable to Wolsey, he determined to quit his retirement, and to make his essay upon the theatre of the great world. He was soon fortunate enough to obtain the situation of chaplain in the household of Dean, then Archbishop of Canterbury, who extended his favour towards the young churchman, more from regard for his personal qualities, than from any interest exerted in behalf of Wolsey by the few powerful friends of whom he could boast.

Upon the Archbishop's death 1502. he was again deprived of a valuable patron; but the favour of others, or even the superior strength of his own understanding, was not all he had to depend upon. At this early period of his life he possessed that courteous dignity of manner which may be improved by intercourse with polite society, but cannot be imparted by that advantage, when the mind is naturally coarse or frivolous. Combining the accomplishments described by one who has not dealt sparingly with his vices,† "Doctus, et oratione dulcis—Corporis etiam gestu, et habitu concinnus,"‡ Wolsey verified the description given of him by Shakespeare, that "he was fashioned to much honour from the cradle," and displayed in his deportment every thing which inspires regard, and enforces respect. Accordingly we find that he, who was reputed a low and disorderly man at Lymington, acquired the favour of Sir John Nanfan, a "grave and very ancient knight," with whom he chanced to become acquainted. Sir John at this time held the important office of treasurer to the city of Calais, where Wolsey attended him in the capacity of chaplain; but it was not long before the knight, discovering the abilities and industry of his inmate, confided to him almost the entire charge of his public business. This confidence remained unimpaired; and Nanfan, upon his retiring from office on the score of old age, recommended Wolsey to Henry the Seventh in such earnest terms, that the king made him one of his chaplains. Wolsey may now be considered as in the avenue to greatness. There was, indeed, little probability of his attaining, over the mind of that wary and calculating prince, the influence which he afterwards acquired with his successor. Henry the Seventh, perhaps one of the most prudent and successful kings that ever sat upon the British throne, directed all the energies of an acute and active mind to objects of public interest. Approving of literature, he had yet neither sufficient enthusiasm to be fascinated with the wit of Wolsey, nor sufficient knowledge to appreciate his learning. He considered business as the paramount, if not the sole object of importance in life; and he expected in those around him the same assiduity and regularity of habits, of which he gave them the example. His ministers were, as might be expected, laborious and indefatigable servants of the crown, who exercised in their several departments, and required in their inferiors, exactness, steadiness, and dispatch. When they observed that Wolsey, after saying mass in the closet before the king, "spent not forth the day in vain idleness, but gave his attendance upon those whom he thought to bear most rule in the council,"* they naturally gave their confidence to a man who exhibited that self-denial, and power of application, without which no votary of ambition has ever attained pre-eminence in public affairs.

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* Fiddes's Life of Wolsey, p. 6.

* Cavendish, p. 68.

† Archbishop Parker—to whom we owe, in a great measure, the formation of our excellent Liturgy.

‡ See Fiddes, Note, p. 16.

The ministers who chiefly enjoyed the favour of Henry the Seventh were Fox, Bishop of Winchester, and Thomas Howard, Earl of Surrey. Fox had retained his post the longest, and most resembled his royal master in his notions of economical management, which amounted to penuriousness: but Surrey, from his military reputation, and from his office of Lord Treasurer, might be considered the most powerful of these two distinguished subjects. By Fox, the abilities of Wolsey were discovered early, and appreciated justly; and both regard and confidence were manifested by the bishop towards his former dependant, to the latest period of his own existence. Sir Thomas Lovel, master of the king's wards, and constable of the Tower, was another valuable friend, whom Wolsey, by his merits or address, contrived to secure among the privy councillors. This knight, who had the character of being both witty and wise, retained his favourable sentiments towards Wolsey until his death; and bequeathed to the object of his early preference, a golden standing cup and four hundred marks of gold, in testimony of his affection.*

Aided by these powerful friends, Wolsey soon obtained an opportunity of displaying his zeal in the service of the king. It was at this time that a treaty of marriage was contemplated between Henry the Seventh and the Duchess of Savoy. It was necessary to treat with Maximilian, Emperor of Germany, the father of the duchess; and a person qualified to undertake this mission was required by the king. Conversing one day upon this subject with Bishop Fox and Sir Thomas Lovel, Henry was persuaded to send for Wolsey, whom his two friends commended in high terms, as possessing the eloquence, address, and prudence necessary to conduct an important and delicate negotiation. Wolsey, on being introduced into the presence of the king, displayed so much discretion and ability, that Henry commanded him to prepare immediately for his journey, and to receive the instructions necessary for his undertaking, from the council. Wolsey resolved to exert his powers to the utmost, in order to secure the favour of the monarch, whom he contrived still further to propitiate in the subsequent interviews, previous to his departure. Having obtained his dispatches, Wolsey, after taking leave of the king at Richmond, about noon, reached London at four o'clock; he proceeded to Gravesend, where he arrived in three hours; hastened from Gravesend to Dover, which he entered on the following morning, just in time to step into the passage boats which were under sail for Calais. From Calais he hurried onwards to the emperor, who was at a place not far from that city; and after obtaining an immediate and favourable audience with that exalted personage, he was allowed to depart shortly after the interview. Wolsey now hastened homewards with as much expedition as he could command: his activity met with its due reward; for he succeeded in arriving at Richmond before the king had even dreamed of his having left England. The diligence with which he performed his mission was considered the more remarkable at that time, when travelling was impeded by scanty accommodation, by the danger of highway robbery, and by the badness of the roads; the first act for the regular repair of which was not passed until twenty years afterwards.[*] The king was so little prepared for the extraordinary promptness of his messenger, that on Wolsey's entering the royal chamber, he began to reprove him for his dilatoriness, in so long delaying his departure. But he, producing the letters of credit which he had brought from the emperor, acquainted Henry with the details of his mission, in which he had somewhat trangressed the limits of his instructions. The king was delighted with the zeal and address of his messenger, and was even pleased with the manner in which, upon his own responsibility, he had ventured to exceed his commission. It was not, however, the habit of Henry the Seventh either to promise lavishly, or to reward liberally, the services of his subjects. With his accustomed reserve, he dissembled his surprise at the quick return of Wolsey; yet it was not long before he recompensed his zeal, by installing him in the Deanery of Lincoln,[†] at that time the most valuable benefice under a bishoprick; Feb. 1508. and soon afterwards, the rising churchman was appointed almoner to the king. The incident which procured these distinctions, was probably regarded by Wolsey as extremely conducive to his advancement; for long after it had occurred, when the vicissitudes of his life caused him, perhaps, to dwell with a pleasurable regret upon earlier and happier days, he related to Cavendish the circumstances of his first transaction in state affairs, with a minuteness which has been faithfully copied by that admirable biographer.[*]

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* Cavendish, p. 76.

* Cavendish, edited by Singer.

The death of Henry the Seventh, which took place in 1509, had been anticipated by the persons in attendance upon him, for some time before Wolsey was introduced to his notice. That Wolsey, warned by the precarious state of the king's health, endeavoured, before his decease, to insinuate himself into the favour of the heir-apparent, appears probable; for one of the first acts of Henry the Eighth, upon his accession to the throne, was to make the almoner privy-councillor, and to present him with the house and gardens, at Bridewell, in Fleet Street, formerly belonging to Sir Richard Empson, but falling, upon his attainder, to the crown. This mansion, on the site of which Salisbury Square and Dorset Street now stand, was surrounded with gardens, extending to the river, twelve in number, and with orchards corresponding in size. It was for some time the scene of Wolsey's splendour, and of Henry's revels, until the favourite became the possessor of York House, and the builder of Hampton Court and of Esher. But, notwithstanding the favour manifested by this donation, the greatness of Wolsey cannot be said to have commenced immediately upon the accession of the young king. Compelled, for some time, to play a subordinate part in the council, it was his successful endeavour, before attaining any political influence, to secure that secret empire over the mind of his sovereign, which should prove more powerful than either tried capacity or long service. It would not have been practicable for mean abilities to acquire, in any large measure, the esteem of Henry the Eighth, who, before his understanding was undermined by conceit, and cramped by prejudice, was a youth of such promise, that, to use the words of his biographer, had the performance of his riper years answered it, "none of his predecessors would have exceeded him: but as his exquisite endowments of nature engaged him often to become a prey to those allurements and temptations which are ordinarily incident to them, so his courage was observed, little by little, to receive into it some mixture of self-will and cruelty."[†] The arts by which Wolsey sought to recommend himself, while they flattered the passions of the gay and ardent monarch, were addressed, likewise, to his intellectual qualities. Perceiving the inclination which he betrayed for the pleasures calculated to allure a youth of eighteen, the crafty churchman advised the king to follow the bent of his desires, and to leave the management of state affairs to his councillors, with whom he promised to make arrangements, by which propositions might be reported when they had been digested by older heads, and all the trouble of discussion should have been concluded. At the same time that Wolsey proffered this suggestion, he counselled the king to pursue those studies to which his attention had been directed from his childhood; and especially to continue a diligent perusal of the works of Aquinas, for whose doctrines Henry entertained a lively partiality. With discourses of this nature, Wolsey mingled instructions on the art of government, and disquisitions on important subjects of every nature: so that while Henry regarded him with pleasure as the promoter of his enjoyments, he could not fail to view him with admiration as a politician, and with reverence as a divine. It was, however, no easy task for a man arrived at his period of life, to combine his habits with the ideas and pursuits of a young prince not half his age, who might prefer the society of so many gay and gallant courtiers, all emulously seeking his favour. But Wolsey, with singular address, instead of driving his youthful rivals from the presence of the king, endeavoured to conciliate them by those attractions of wit and eloquence which he possessed in an eminent degree. It is natural for the inexperience of youth to be flattered by every tribute of regard paid to their imagined consequence by those who have outlived the follies, without losing the elasticity, of that fickle age. From those among the male favourites of Henry, who were most endeared to the king by their merits and accomplishments, Wolsey playfully demanded a compact of mutual fidelity and good offices. With the highly-born ladies by whom the court revels were shared and adorned, he was equally solicitous of favour. "Whosoever of them was great, to her he was familiar, and gave her gifts."[*] He was courteous and liberal to all; he sported, he jested, he sang, he even danced; forgetting, or perhaps holding in lower account, the decorum proper to his sacred habit.

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[*] In the fourteenth and fifteenth years of Henry the Eighth. Until the reign of Charles the Second, the roads were repaired by the landholders in the respective counties, upon whom a rate was imposed. ANDERSON'S Hist. of Commerce, vol. ii., p. 44.

[†] Le Neve's Fasti, p. 146.

[*] Cavendish, p. 77.

[†] Herbert, p. 2.

Exertions, so well directed, soon obtained for him such influence at the court, as had not been enjoyed by any minister in the preceding reign. Those who had hitherto employed him as an agent, now sued to him as a superior. The two contending parties in the council quailed before his ascendancy. The Earl of Surrey, who had hitherto seen in him only the humble but useful ally of Fox, now began to fear him as a rival. Fox, who had endeavoured to accelerate his rise in the hope of his aid to resist the encroachments of Surrey, perceived that he had fostered a man so gifted by nature, and so energetic from habit, that he could never be chased from the road to preferment, after he had once entered upon the right track. Such of the nobility and courtiers as had suits to prefer, or were anxious to recommend themselves to the notice of the king, found it expedient to ensure a welcome through the mediation of Wolsey. The court had been little attended during the reign of Henry the Seventh; divisions, resulting from the civil wars, had prevented many of the nobles from presenting themselves to the Lancastrian monarch; poverty had detained some, and the absence of all attraction in an economical and gloomy court, had kept many within their remote but more hospitable mansions. Now the scene was changed, and suitors, long withheld from these various motives, thronged around the king and Wolsey. So plentiful, as Cavendish tells us, were the presents proffered to Wolsey, in order to procure his good offices, that "he wanted nothing, either to please his fantasy, or to enrich his coffers, fortune so smiled upon him; but to what end she brought him, you shall hear."[*] Meanwhile honours were showered upon him by the king, with a lavish hand; he was presented to several livings of value, in addition to those which he already enjoyed; he was appointed Registrar of the Order of the Garter, and was not 1510. long afterwards intrusted with an office still more active and important, to keep him about the person of the king.

Scarcely was Henry the Eighth seated on the throne, than inducements were held out to him to enter into hostilities against France; and his vanity rendered such propositions too acceptable to be rejected. It would have required, indeed, but little political skill to have preserved the country in that state of tranquillity in which his prudent father had left it. Ferdinand, King of Spain, was solicitous to remain at peace with England, an union with which had been cemented by the marriage of Henry with his daughter. Maximilian, Emperor of Germany, was too anxious to secure the possessions of Burgundy, and the Low Countries, which he had obtained in right of his wife, to offend so important and warlike a nation as the English. The pope, Julius the Second, sought to secure the alliance of England, which he hoped to engage in his own designs against France. He paid the utmost deference to Henry, to whom he sent a golden rose, dipped in chrism, and perfumed with musk, to be presented to the king at high mass, with the benediction of his holiness. But this emblem of peace and sanctity was accompanied by a letter from the pope, breathing sentiments of the utmost hostility against Louis the Twelfth of France, and representing that monarch as one who, having no regard either to God or to a good conscience, designed to build his own greatness upon the entire conquest of Italy.

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[*] Strype's Eccl. Memorials, vol. i. p. 189.

[*] Cavendish, p. 62.

Henry the Eighth, like his predecessors of the Lancastrian line, had set out in his career with professions of profound veneration for the holy see. Actuated partly by the necessity of appearing consistent with his declarations, but more by the ambition of signalizing his name as the restorer of the conquered territories in France to the English crown, and by the desire of asserting his title to the throne of France, the gay, impetuous king resolved to attack the dominions of his neighbour, and to take the command of the invading army in person.

It was scarcely probable that Wolsey would oppose a design which must have been so acceptable to the pope, whom, as a churchman, he was inclined by education, and bound by interest, to conciliate. It is at the same time likely that he perceived the folly and inutility of the scheme, which plunged a secure and prosperous nation into unnecessary difficulty and expense. Whatever may have been his secret opinions, he possessed not, in all probability, at this time, influence sufficient to change the course of events; and it is to be feared that he was not disinterested enough to desire it. War was accordingly declared: the league into which Henry entered with Maximilian and Ferdinand, was dignified by the name "*Holy*," although it originated in motives varying widely from the avowed desire of protecting the pope from the incursions of France. Surrounded by all the martial portion of his own subjects, and displaying in his own person youth, strength, and warlike ardour, Henry felt that his triumphs would be adorned, and his anxieties diminished, by the presence of Wolsey, on whose counsels he had learned to depend, and whose society he had begun to think indispensable to his enjoyments. The important, but inglorious office of victualler to the forces was, therefore, conferred upon Wolsey. In accepting it, he at once evinced good sense in disregarding the illiberal sarcasms cast upon his birth, and displayed the variety of his knowledge, and the versatility of his talents, by which he was enabled to undertake business of a nature totally unlike any in which he had hitherto been engaged. He felt, doubtless, the importance of remaining in constant personal communication with the king, who was at an age when impressions are easily made, and swiftly effaced; and he was rewarded for his exertions as victualler, by an appointment of a higher description.

All preparations being at length completed, the king set sail from Dover, on the last day of June, 1512, and after resting a short time at Calais, proceeded to Therouenne in Artois, before which part of the English army had already encamped. Wolsey, with his retinue, followed in the rear, accompanied by the Bishop of Winchester: their united retinues amounted in number to eight hundred men, under the command of Sir William Compton. The place having yielded to the English troops, it was thought expedient to raze it to the ground, excepting the religious houses only; and the victorious army proceeded to invest Tournay, which surrendered, after a short siege. This place, being a bishop's see, having a cathedral, and several churches and monasteries, was deemed worthy of a better fate than that which had been decreed to Therouenne. The interested advice of Wolsey has been assigned as the cause of a preference which seemed directly opposed to good policy. Therouenne, which was near the English pale, might justly be considered as a more valuable fortress than Tournay, an acquisition of comparatively little moment. The indiscretion which sacrificed the more important conquest, resulted from the folly of Henry in acceding to the wishes of Maximilian, whose dominions, contiguous to Artois, were frequently annoyed by incursions of the French from Therouenne. Tournay was, therefore, preferred, and was deemed worthy of an English garrison, under the command of Sir Edward Poynings; Wolsey was also made Bishop of Tournay; and he received from the inhabitants, as their pastor, an oath of allegiance to the King of England. Arrangements for its security having been completed, Henry, congratulating himself on having subdued a place famed in history for its resistance to Julius Cæsar, took advantage of his new conquest to hold a solemn feast, which was attended by the Emperor Maximilian, the Duchess of Savoy, and the young Prince of Castile, afterwards Charles the Fifth. These festivities were succeeded by other diversions at Lisle; after which Henry, swelling with the pride of his showy but unprofitable honours, returned to England, followed by the gay and the ambitious, the frivolous and the intriguing throng Oct. 1513. of courtiers, who had attended his expedition, or flocked to its successful and useless results.

Some time before Wolsey derived the full benefit of his consecration to the Bishoprick of Tournay,[*] the inhabitants of that city, attached to their former diocesan, and disliking the dominion of a foreigner, resisted the spiritual jurisdiction of Doctor Sampson, whom Wolsey had left in Tournay as his vicar-general; but he finally triumphed over his episcopal adversary, and, by his diligent attention to the business of the town, obtained the chief management of its affairs, and became a popular ruler. This see afforded him considerable revenues, and its citizens treated him almost as a prince, addressing their dispatches "To my Lord Cardinal's grace, and the privy council."[†] But even higher dignities were reserved for Wolsey on his return to England. The see of Lincoln, vacant on the death of Doctor Smith, became the next step in his ascent to the height which he was destined to attain of wealth and power. This rapid succession of honours and accumulation of riches were insufficient to satisfy the grasping desires of one, who, while he distributed freely, coveted largely the good things of our worldly condition.—Scarcely was the ceremony of his consecration over, before he disgraced his holy office by a successful attempt to possess himself of goods belonging to his predecessor; and Cavendish, repressing, from a sense of justice, his partiality for Wolsey, confesses that he had, at various times, seen the stolen furniture in the house of his master. Tournay and Lincoln were both conferred upon him in the same year; but a yet higher dignity awaited his acceptance: Mar. 26, 1514. for within a month the archbishopric of York being vacant, he was endowed with the temporalities of that see in August, and was actually translated to it in November. This sudden elevation to the second dignity of the Anglican church, Wolsey owed, no doubt, in part, to one of those accidents which occur in the life of every prosperous individual. Bambridge, the late prelate, was a man in the vigour of life, who held the station of ambassador at the court of Rome, in conformity with the custom then prevalent of employing churchmen in the missions, now more suitably, as well as advantageously, assigned to the laity. The death of Bambridge, which happened suddenly, was attributed to various causes, but it was undoubtedly the effect of poison, administered by some unknown hand, and imputed by common report to his steward, whom he had struck in a fit of passion. A more authentic account unhappily affixes the crime upon Giglis, bishop of Worcester, an Italian, who succeeded Archbishop Bambridge as ambassador at the court of Rome; and the pope, unwilling to throw discredit upon the church, is said to have concealed the dark deed, and to have screened it from punishment.[*]

Elated by the rapid progress of his fortunes, Wolsey now displayed the arrogance of his character, without fear or scruple. Warham, Archbishop of Canterbury, and at this time lord chancellor, was the first to feel the encroachments by which his brother of York sought to enhance his own dignity, at the expense of the rights of others. It had been the custom, before the elevation of Wolsey, for the cross of Canterbury, borne before the archbishop, on solemn occasions, to take precedence of the cross of York, except within the diocese of York. Great importance was attached to this distinction, and in the reign of Edward the Third, a parliament being summoned at York, attendance was refused by the Archbishop of Canterbury upon the plea that the metropolitan of England should not be constrained to lower the emblem of his dignity before the ensign of his brother archprelate.* In defiance of the established usage, Wolsey ordered his cross to be erected, not only within the precincts of Warham's jurisdiction, but even in his presence; nor would he, on the remonstrances of the primate, desist from this act of intrusion. To possess, however, as of right, and not merely by usurpation, and to exercise superiority in all points of worldly greatness, was most agreeable to a man so constituted as the new archbishop, and he resolved to sue for the rank of cardinal, a promotion which he trusted might be followed by the yet higher honours of a legatine commission. Leo the Tenth, who had succeeded Julius the Second in the pontifical chair, was disposed, both from inclination and policy, to bestow the desired honour upon the favourite of a powerful monarch, a dignitary who was likely to reflect credit upon the church. The mode which Leo adopted of forwarding to Wolsey the insignia of his new honours was not, however, approved by the cardinal elect; and being apprised that the "*hat*" was on the road to England, in the charge of a common messenger, or, according to the language of the times, "in a varlet's budget," Wolsey deemed it essential to his dignity that a more honourable means of conveyance should be provided. Previous to the arrival of the papal messenger in England, he was replenished, by the command of Wolsey, with a variety of costly decorations and habiliments, suitable to the importance of his burden. The hat was met on Blackheath by a great number of the clergy, and of gentlemen, and was then conducted to London with great triumph. Meanwhile preparations were made for its reception in Westminster Abbey, where all the bishops and abbots of London and its vicinity were assembled in their richest copes and mitres, in order to celebrate the confirmation of this new dignity to the Cardinal. So solemn was this ceremony, that Cavendish, who was present, declares that he had never witnessed a more imposing scene, except at "the coronation of some mighty prince or bishop."* Nor did the honours of the hat terminate here: in all public processions, it preceded the Cardinal wherever he went; when he performed mass in the king's chapel, this emblem of his ecclesiastical degree was placed upon the altar, appearing before the people as an idol, set up by the pride of Wolsey to be worshipped. In this display of his newly-acquired honours, Wolsey had a deeper aim than the mere ostentatious and childish exhibition;—the age was one of ceremony and of pomp; and by a costly exterior, always most admired among a people the least prone to intellectual culture, Wolsey, perhaps, thought to obliterate the remembrance of his obscure origin and sudden rise to power. Unhappily for him the event proved otherwise, and the magnificence of the Cardinal drew upon him the bitterness of popular sarcasm, the secret jealousy of the nobility, and the dislike of the clergy.

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[*] Strype's Eccl. Memorials, vol. i. p. 172. [†] Ibid.

[*] Ellis's Original Letters, vol. i., p. 100.

Warham, archbishop of Canterbury, had been regarded hitherto as one of the principal persons about the throne, and as one of the most esteemed among the confidential advisers of the King. Austere and averse to new measures, the Primate beheld with chagrin the ascendency of Wolsey, whose conduct towards him was marked by a haughty assumption of superiority. Warham had long held the high office of Chancellor, and had enjoyed much of the late king's confidence. Averse, therefore, in all probability, to play a second part, but alleging his age and infirmities as a plea for his retirement, he resigned the seals, which were immediately offered to Wolsey. The conduct of the Cardinal on this occasion has been variously stated; and even Cavendish reports him to have driven Warham from office by his intrigues. But this statement is incorrect; the resignation of Warham was voluntary, and even his own friends appear to have imputed no blame to his rival and successor. Ammonius, the friend of Erasmus, in writing to that celebrated man, who was warmly attached to Warham, expresses himself thus: "*Your* Archbishop, with the King's good leave, has laid down his post, which that of York, with much importunity, has accepted of, and behaves most beautifully."† The change in this important station was soon followed by the temporary retirement of several of the most favoured courtiers, and the resignation of some of the most experienced ministers. The Duke of Norfolk begged permission of the King to withdraw to his country residence; for the embarrassed state of the finances, arising from the lavish expenditure of the Monarch, rendered it difficult for this able statesman and dexterous courtier to play his part, and preserve his reputation, in both characters. Yet the Duke, divided as he was between fear of offending his sovereign, and the risk of ruining the country, resigned not his situation until 1522, when he was succeeded by his son, the Earl of Surrey. The Duke of Suffolk, unjustly incensed against Wolsey for refusing to cancel his debt to the King, absented himself for some time from court, but was soon recalled to the presence of Henry, whose favour he continued to enjoy long after the more brilliant prospects of the Cardinal had been darkened by reverses. Fox, the early patron of Wolsey, quitted the court, more in sorrow at his own loss of power, than in anger towards him whose exaltation he had hastened. The advice of the Bishop to Henry, that he should beware how he allowed the servant to be greater than the master, "drew forth a reply which was amply verified in this reign—that the servants of the King should obey, and not command."

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* See note in Singer's edition of Cavendish, p. 90.

* Cavendish, p. 92.

† Cavendish, by Singer. Note, p. 92.

Chapter Second.

Preferments, Revenues and Household Establishment of Wolsey.—His sentiments towards Francis the First.—Wolsey as a Judge,—as an administrator of the Church Laws.—Mission of Wolsey to France, and its consequences. [1516 to 1521.]

1516.

Wolsey was now Cardinal de Santa Cecilia, Archbishop of York, and Chancellor of England. His aspiring mind was not satisfied even with these distinctions; and resolving to obtain the supremacy in ecclesiastical affairs relating to this country, he sought, and procured a bull, investing him with legatine authority. This commission procured to the Cardinal a vast accession both of wealth and influence; and it appeared scarcely possible that he could exercise the authority thus intrusted to him, in the three great situations which he filled, without peril to himself, and encroachment upon the equity of the King.

To support the style suitable to his rank in the church and the state, the revenues of Wolsey were necessarily the object of his solicitude; and it is melancholy to see that in a mind naturally liberal, ambition gave birth to avarice, and avarice engendered laxity of principle. This powerful statesman, who should have been incorruptible, scrupled not to receive from Charles the Fifth, Emperor of Germany, the annual bribe of three thousand pounds Flemish; and from Francis the First, twelve thousand livres, also paid yearly, in order to secure the interest of the Cardinal in behalf of those Princes.* Nor did he blush to stipulate with the secretary of the Duke of Milan, that, upon the promise of an inviolable peace between Henry the Eighth and that Potentate, an annuity of ten thousand ducats should be transmitted to enrich the coffers of Wolsey, during the life of the Duke.† In addition to these acts of baseness, it is recorded, to his further disgrace, that he was accessible to the influence of presents, in the exercise of his legatine office; and that he degraded himself by extortions to a considerable extent, in that capacity. Augmented by these resources, the income which Wolsey enjoyed would appear ample, even if estimated according to the value of money in the present day, when a pound is equivalent to a crown only of the coin of Henry the Eighth. But Wolsey had still other means of obtaining wealth. Besides the scandalous emoluments already recited, he derived profits of a less reprehensible nature, from the bishoprics of Bath, Worcester, and Hereford, which he held in farm for the foreign dignitaries to whom these sees belonged, and who preferred receiving from them a regular sum to an uncertain and precarious collection of their full revenues by agents.‡ This injurious system had been too long practised to reflect upon the conduct of Wolsey in lending his countenance to it; it had even been encouraged by Henry the Seventh, who, with great professions for the weal of the church, had chosen thus to risk its best interests, by rewarding foreigners, sent on legations or other business, with benefices upon which they could not reside; a mode of payment more consonant to the inclinations of that wary king, than pecuniary remuneration for the services rendered to him. Beside the sums reaped from this commercial scheme of managing ecclesiastical affairs, Wolsey derived the privileges of patronage in each diocese; for the disposal of the livings in the presentation of the foreign bishops was included in his bargain: and, with his usual dexterity in turning all things to the best account, it may be conjectured that this authority was not unproductive of emolument, as well as power. To the funds arising from these sources were added those proceeding from the rich abbey of Saint Albans, held by him in commendam, although he did not enter upon its temporalities until 1521. It is true that when Tournay was afterwards restored to the French, he was compelled of course to resign the bishopric of that city; but he received twelve thousand livres yearly by way of compensation: and the bishopric of Durham, which he also held, but resigned into the King's hands upon the death of Bishop Fox, he relinquished in like manner for the see of Winchester, to which he was immediately advanced.*

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* Anderson's History of Commerce, vol. i. p. 30.

† See, in Rymer's Fœdera, vol. xii. p. 585, a promissory obligation to this effect, from the secretary of the Duke of Milan.

‡ See Fiddes's Life of Wolsey, p. 207.

That Wolsey, possessing such opportunities of accumulating money, should not have provided for a reverse of fortune but too probable in his case, by transmitting sums of money to some foreign agent, appears to indicate a remarkable want of foresight, or a strangely overweening confidence in a man otherwise so gifted. He seems, indeed, while he collected rapaciously, to have spent lavishly; and there are few narratives which present a more curious detail of combined luxury and pomp, than the account given by Cavendish of the household arrangements, the dress, and the retinue of Wolsey.

In compliance with the practice usually adopted by the nobility of the times, Wolsey formed his domestic establishment upon the model of the royal household. The vast number of individuals residing under his roof were ranged in three classes; a distinction esteemed necessary when the attendants varied in their rank and origin from the son of an Earl, to that of a peasant. Accordingly, three tables were spread daily in the great hall, in which the ample, but rude and unsocial repasts of our ancestors were uniformly served; and where the invidious and indelicate interposition of the salt-cellar, to divide the superior from the inferior classes, was as widely at variance with our present improved notions of right, as with all the feelings of propriety which forbid the appearance of any distinction whatever between guests who are admitted to the same board. It is probable that, in Wolsey's household, the various ranks and offices of each individual were more systematically defined, than among the numerous, but sometimes ill-arranged domestics of the nobles of that day. Three tables were placed daily in the hall of the Cardinal, each being superintended by an officer, suitable in station to those over whom he presided. At the head of the first table sat a priest or dean, who fulfilled the capacity of steward, and whose company at the table consisted of the first class of domestics; while the treasurer, who was always a knight, and the comptroller, an esquire, each of whom bore white staves of office, took their seats at the head of the second and third tables. The lower class of domestics, who performed the menial offices, took their meals in the hall kitchen, under the direction of two clerks, besides a clerk of the kitchen, a surveyor of the dresser, and other agents in this well-arranged system of luxury. But in addition to the tables thus enumerated, as daily spread for the accommodation of the household, there were others prepared in separate apartments. At one board sat a company of young lords, who were placed under the roof of the Cardinal for the purpose of polite education, and who paid for their board and tuition. These youths were intrusted to the care and guidance of an instructor of the wards, whose duty it was to initiate his pupils in the forms of graceful behaviour, and in the mode of exhibiting a proper deference toward superiors. Each of these noblemen was allowed several servants; the Earl of Derby, who, as well as Lord Henry Percy, the son of the Earl of Northumberland, was an inmate of Wolsey's, had five, but most of the young lords were contented with two, attendants. The gentlemen ushers, among whom was Cavendish, the biographer of Wolsey, were permitted to sit at the "mess of lords:" but another table was prepared for the chamberlains and gentlemen waiters, although these were men sprung chiefly from good families. Of Wolsey's individual repast, nothing is said by Cavendish; but it is probable that he sat with the young lords.

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* See Lord Herbert, p. 78.—Cavendish, p. 95.

The kitchen of the Cardinal was under the direction of a master cook, who went about daily, in garments of damask satin, or of velvet, and wore a chain of gold round his neck. To execute the commands of this distinguished and important personage, were two grooms, six labourers, and as many children, who probably assisted in turning the spit; a laborious, but indispensable occupation, both degrading and unwholesome, the necessity of which has been happily superseded by well known machines of modern invention. The allied offices of larder, scalding-house, wafery, bake-house, scullery, buttery, pantry, ewery, chaundery, cellar, and garden, together with the laundry, and wardrobe of beds, had each distinct grooms, yeomen, and pages, varying in number according to the occupation required in each province. To this list must be added two tall yeomen and two grooms, who acted as porters; a yeoman of the barge; a master of the horse, a clerk and yeoman of the stable; a saddler, a farrier, a yeoman of the chariot, a sumpter-man, a yeoman of the stirrup; a muleteer, and sixteen grooms of the stable, each of them keeping four great geldings.

A yet more numerous and more expensive order of inmates, however, deserve notice. Much of the expenditure of a nobleman, or dignitary of the church, in those days, went to support a numerous and luxurious body of chaplains, who were liberally paid, sumptuously maintained, and, when officiating in their sacred office, magnificently attired. There were in the service of Wolsey, a dean, who was always a great divine; a sub-dean, a repeater of the quire, a gospeller, or reader of the gospel, a pisteller or reader of the epistle, and twelve singing priests. These clerks all found means to enrich themselves in the household of their opulent and lavish patron; and were proved at the exposure of his affairs, which eventually took place, to be the richest of his dependants. To assist in the performance of the fascinating, but unsatisfactory service which the church then enjoined, these clergymen had twelve singing children, and sixteen adult choristers, with a master to instruct the children, and a servant to attend upon them; and occasionally there came, says Cavendish, "divers retainers of cunning singing men," to swell the full strains which were sung at the principal feasts. Our simpler and more rational notions of the services acceptable to the Most High have banished, perhaps with too unsparing a hand, the luxury of hearing fine devotional music in our churches; but it is agreeable to reflect on the improvement of taste which has abolished the gorgeous dresses, approved even by the cultivated and fastidious taste of Wolsey. The furniture of his chapel, the jewels, ornaments, and garments placed there for the use of the priests, the crosses, candlesticks, and other implements of devotional splendour, were more than ordinarily costly and abundant; and Cavendish enumerates forty-four copes of the richest materials to have been occasionally displayed by the chaplains of the Cardinal, when in solemn procession. Beside this clerical establishment, Wolsey had an almoner, whose usual office in such households was to attend upon the lord and master at dinner, in conjunction with the carver, the cup-bearer, the gentlemen yeomen, and gentlemen waiters, and, in some families, to have the residue of the repast at which they had assisted.* This class of attendants amounted, in the household of Wolsey, to forty-six in number, and with the chamberlain, vice-chamberlain, gentlemen ushers, yeomen ushers, grooms of the chamber, and yeomen of the chamber, may be considered as the peculiar and personal servants of the Cardinal. These formed, alltogether, a body of one hundred and forty-three persons.

The secretaries, clerks of the signet, and counsellors of Wolsey, of whom he had six, were always persons of information and character. Sir Thomas More, Gardiner, bishop of Winchester, and Thomas Cromwell, afterwards prime minister, each at some period of their lives held one or other of those offices in the establishment of Wolsey; a mutual advantage being afforded to master and dependant by the free intercourse of powerful, though dissimilar minds. x

The manner in which it was the daily custom of this proud prelate to repair to the exercise of his public duties, was suitable to his domestic splendour. In the morning, after being apprized that a number of peers and of commoners awaited his appearance, Wolsey came forth from his chamber, into his state apartments, in his cardinal's dress of crimson or scarlet satin or damask, the richest that could be procured, and wearing upon his head a "pillion" or cushion, surmounted with a noble, or elevation of black velvet, attached to the cushion. About his neck he wore a tippet of fine sables; nor was the magnificence of his attire confined to the more conspicuous parts; even his shoes were the subjects of wonder and of ridicule to a satirical contemporary of the cardinal, in a supposed dialogue between two priests' servants.

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* See Northumberland Household Book, pref. 417.

"Rede me, and be not wrothe,
"For I say no thyng but trothe;
"He hath a payre of costly shewes
"Which seldom touche any grounde,
"They are so goodly and curious,
"Are of gold and stones precious,
'Costing many a thousand pounds.
"*Wat.* Who did for the shewes paye?
"*Jeff.* Truly many a rich Abbaye,
"To be eased of his visitacion."[*]

Thus attired, and holding to his nose the peel of an orange filled with sponge dipped in "vinegar, and other confections against the pestilent air,"[†] Wolsey walked with great pomp to the outer door of his mansion, the great seal of England being carried before him, and after that, the cardinal's hat borne by some nobleman, or gentleman, bareheaded. And thus passing on, preceded also by his two great crosses of silver, and followed by two pillars, and a large silver mace, gilt, the Cardinal, amidst the cries of his gentlemen ushers, "On, on, my lords and masters," amidst the envy of some beholders, and the admiration of others, bent his course to the court of chancery, riding upon a mule splendidly caparisoned, and attended by his pillars, his crosses, his pole-axes, and running footmen. While condemning as frivolous and pompous this ostentatious array, the benevolent mind reverts with pleasure to one circumstance, which presents the character of Wolsey in a more favourable aspect. It was not until after he had paid his early and private tribute of devotion at the shrine of "Him who doth dispose and govern the hearts of princes," that Wolsey resorted to the business of that world, the enjoyments and even the cares of which render such a preparatory service but too requisite. To attend the performance of the ordinary masses, merely, might have been deemed by the Cardinal a customary act of decorum, with which no head of a household could, with propriety, dispense. But Wolsey, not satisfied with this observance only, retired within his closet, and alone with his chaplain, a man of learning, and of veracity, he went through his daily service; nor did he, according to the testimony of that person, retire to bed, however he might be oppressed with fatigue of body, or anxiety of mind, with even one collect omitted, in his customary and prescribed devotions.[*]

It was both the interest and the inclination of the Cardinal to render the banquets which he gave to the king more agreeable to Henry, and more dazzling to the courtiers, than the entertainments given by any other person of rank. The king had a childish delight in a surprise, which then constituted the chief spirit of a courtly assembly: accordingly, it was his whim to arrive suddenly at the episcopal palace of Whitehall in a mask, with a small group of companions, dressed to represent shepherds, but with garments made of fine cloth of gold, and their hair and beards composed of silver and gold wire.

The Cardinal, who was seated under his cloth of estate, at a sumptuous banquet, graced by the presence of mingled gentlemen and gentlewomen, was warned of the approach of the royal shepherd by the discharge of "chambers," or small cannon, so called from their being little more than chambers for powder, resting upon no carriages, and adapted only for festive occasions.[†] To play disguised at a game of dice, called num-chance; to dance with the ladies assembled on the occasion; to challenge the guesses of the Cardinal as to which of the newly arrived band was the king, and to enjoy his mistake in fixing on Sir Edward Nevill, a comely and portly knight, for his royal master, constituted the chief diversion of the night, the business of which was eating and carousing. Unsuitable indeed were such amusements to the situation of Wolsey as a dignitary of the church, to his occupations as a minister and as a judge, and to his character as a man; and perhaps they contributed, in reality, but little to the influence which he long held over the mind of his sovereign.

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[*] See Dialogue between Watkins and Jeffrey, two Priests' Servants, by William Roy; the first person, according to Anthony Wood, who reported Wolsey to be the son of a butcher. Wood's Athenæ Oxoniensis, vol. ii., p. 734.

[†] Cavendish, p. 106.

[*] Cavendish, p. 105.

[†] See Cavendish. Note by Singer, p. 113.

The position of foreign affairs, during the early part of the reign of Henry the Eighth, assisted in augmenting the power which Wolsey already possessed. Peace had indeed been concluded with Louis the Twelfth, and it was cemented by the sacrifice of Mary, the young and beautiful sister of Henry, at the altar of policy, where she was united to the king of France, a man nearly three times her age, with the consolation only of being as conspicuous for her rank, as she had before been for her personal charms. The death of Louis had dissolved this unnatural bond; but while it rendered the continuance of the treaty uncertain, it imparted happiness to the queen widow, who almost immediately bestowed her hand on Charles Brandon, Duke of Suffolk. Henry was at first indignant at the choice which his sister had made, having probably cherished the intention of advancing the interests of his kingdom by seeking another alliance between some foreign potentate and his sister.

The part which Wolsey took in this affair was conciliatory, and it may have been disinterested. He warned the young dowager against a hasty marriage,[*] immediately after the death of her royal consort: but, when the consequence of an ardent and mutual attachment became irrevocable, and was avowed, he endeavoured to reconcile the mind of the king to an event which could not be recalled.[†] Henry, who began to perceive that it would be more for the honour of his sister to return to her country with her rich dowry, than to bestow it upon some foreign nobleman, or petty prince, was consoled, also, by the partiality which he entertained for Brandon, one of the earliest and latest of his friends.

The peace which had been concluded between England and France, before the death of Louis the Twelfth, was not of long continuance after the accession of Francis the First. That monarch, brave, generous, and accomplished, was by no means the first aggressor in the hostilities with which he was for some time menaced by Henry. Disposed both by policy and inclination to maintain a close alliance with England, he had, nevertheless, the ill-luck to incur the resentment of Wolsey, who too frequently allowed his private interests to affect the great affairs of his country. The cause which has been assigned for the animosity expressed by Wolsey towards the French king, related to the bishopric of Tournay, which, while it yielded an ample revenue to the Cardinal, had occasioned him considerable trouble and anxiety, from the unwillingness of Guillart, the deposed bishop, to resign his spiritual jurisdiction. Strengthened by a bull from the pope, Guillart had acquired a number of partisans both within the city and elsewhere; and Wolsey, alarmed for the consequences of this success, solicited Francis to confer another bishopric upon Guillart, in order to divert him from prosecuting his designs upon Tournay. Francis either declined, or delayed to comply with this request; and the indifference thus evinced to his interests was not forgiven by the Cardinal, until he had been conciliated by the flattering terms of "Pater" and "Dominus" addressed to him by Francis, and more effectually appeased by the powerful agency of gifts and promises.[*]

1518.

While a sentiment of displeasure towards Francis prevailed in the breast of the Cardinal, the measures pursued by the English government tended to an alliance with Maximilian, Emperor of Germany, with Pope Leo the Tenth, and with the wily Ferdinand of Spain. The death of Ferdinand, the discovery of the artful and plausible character of the emperor, and the skilful negotiations of Francis, produced a manifest change in the politics of the English court. Wolsey was employed as the mediator between Francis and Henry, and he displayed so much address in this important matter, that Henry, in the exultation of his heart, declared "that Wolsey would govern both him and the King of France." Ambassadors were soon afterwards dispatched from France to London, and a treaty was concluded, containing a clause relative to the restitution of Tournay, a point which Henry, prompted by the representations of his minister, was induced to concede.—Wolsey had long been weary of the trouble and insecurity of his foreign see, and the compensation offered to him was a desirable equivalent for sums which were collected and transmitted with difficulty. The other Englishmen, officially concerned in the garrison of Tournay, were also remunerated for the loss of their posts by the distribution amongst them of money furnished by the French king.

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[*] See Ellis's Original Letters, vol. i. p. 118.

[†] Herbert, p. 56.

[*] Herbert, p. 74.

While thus engaged in foreign negotiations, Wolsey exercised, 1518. with diligence and impartiality, his authority as chancellor, an office in which he is said to "have spared neither high nor low, but to have judged every estate according to their merits and deserts." *

The first measures of the Cardinal, in this capacity, were unpopular, and in some instances frivolous and injudicious. Considerable importance was at this time attached to the subject of apparel, and by a recent act, the dress of the laity of every condition had been regulated, forfeitures being assigned for the neglect of its observances. To enforce the new statute, Wolsey sent commissioners into different counties, with charges also to regulate the wages of labourers, their hours of meals, and of rest, settled, in these despotic times, by act of parliament. These agents exceeding probably the injunctions given them, a degree of tyranny was exercised which occasioned the loudest discontent. At Rochester, the just indignation of the populace broke forth on seeing a man pilloried for no greater offence than that of wearing a shirt made of a particular kind of cloth called "ryven." It is difficult to comprehend why so much stress was placed upon a mere distinction in the texture of habiliments, unless it may have originated in a desire for the protection and benefit of some particular manufacture, at that time in need of encouragement. Wolsey was not, it appears, at all times superior to the indulgence of petty irritation, and he even committed his dignity in the dispute, by taking the law into his own hands. Observing, one day, an elderly man in an old crimson jacket, adorned with various brooches, the Cardinal, with his own hands, took from him a dress which the offender was probably not entitled by his rank to wear, but which compassion and decorum should have spared to the aged and defenceless delinquent.†

This act of severity excited much animadversion upon the conduct of Wolsey; and a similar degree of unpopularity attended the necessary duty of calling to account all those persons in whose dealings either fraud or carelessness was detected, touching the money transactions of the late war. The most salutary regulations were also made respecting perjury, a crime of alarming frequency in the preceding reigns, when evidence in the various courts of justice might be openly bought and sold. Wolsey visited this offence with severity proportioned to the heinousness of an act, which, in the words of Lord Herbert, comprises murder, theft, and detraction: it was, therefore, greatly diminished. During the legislation of this vigorous but unpopular minister, who sedulously endeavoured to inculcate the necessity of a regular administration of the law, courts were erected in order to protect the poor from the oppressions of the rich, who, in those days, thought the world made only for them. These tribunals were at first thronged, but soon fell into disrepute from the delays and improper decisions to which the suitors found themselves liable; and the courts of common law were eventually preferred.* The intention of Wolsey, in thus providing for the benefit of the lower classes, was, however, laudable; and while he exercised a due authority over them, he endeavoured, on various occasions, to raise them to a state of greater independence, and of more importance in the state. By his vigilance and rigid administration of justice, the highways were in a great measure freed from robbers, by whom, in the absence of a regular police, they had been infested to an alarming extent. Acts of violence were visited with speedy and impartial retribution, and, according to the celebrated Erasmus, who was well acquainted with this country,—"it became as free of harmful men, as it was of poison and noxious beasts."† Lawsuits, which had long wearied the suitors, from the vexatious indecision of preceding chancellors, were now equitably adjusted. The decisions of Wolsey as a judge were allowed to be generally impartial, and his estimation of the evidence before him judicious. "It was strange," observes a chronicler of this period, "to see the Cardinal (a man not skilled in the laws) sit in the seat of judgment and pronounce the law, being aided at first by such as (according to ancient custom) did sit as associate with him; but he would not stick to determine sundry causes, neither rightly decided nor adjudged by order of law."* He would even reprove sharply those judges who had allowed themselves to be imposed upon by false evidence, and who had not well considered the testimony of both parties. A degree of celerity in the dispatch of legal business was ensured by Wolsey, deserving of gratitude, both from his contemporaries and from posterity. Upon the representation of the Cardinal, the king granted a commission to the master of the rolls, the chief baron of the exchequer, and four of eighteen persons specified, to hear and determine causes in chancery when the chancellor should happen to be engaged in state affairs. This privilege has continued, with some variations, until the present day. Disgusted by the ignorance of the lawyers, and even of the judges, he planned an institution in the metropolis, by which opportunities for studying that science should be afforded to the diligent; but this project, like several beneficent and liberal designs of the Cardinal, was never realized. The model of the building was long treasured in the palace of Greenwich, after the death of Wolsey, as a fine specimen of architectural taste.†

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* Cavendish, p. 107. † Hall's Chronicles.

* Herbert, p. 67.

† Strype's Ecclesiastic Memorials, vol. i., p. 193.

During this period of our history the Chancellor had the sole power of bringing Bills into Parliament, which he exercised by means of committees of his own appointment. An examination therefore of the Statutes passed during the term that Wolsey held the Seals, would show the principles of government on which he acted, and would throw additional light on his general character. Two-thirds of them would be found to be enacted for the protection of trade and manufactures, all of which are now either repealed or have fallen into disuse. These acts, by the number of their minute and painful restrictions, sometimes on the manufacturer and importer, and sometimes on the consumer, evince at once the laudable anxiety of the minister for the welfare of the industrious classes, and his profound ignorance of the great truth, that commerce is always fettered and never served by the officiousness of legal interference. The excellences and defects of Wolsey's legal administration (so far as it was honest) seem to spring from the same source—the industry with which he carried legislation into a rigid and minute detail. His amendments in the various processes of the law,—his reform of church discipline, especially in his attack on pluralities,—are favourable instances, and ought not to be forgotten in the balance of his merits. Indeed, even with respect to his interference with the freedom of trade, he ought, perhaps, rather to be praised for having so distinctly seen the value of the object, than censured for having mistaken, in common with men of later days and better lights, the means by which the object was to be obtained.

In his administration of the affairs of the church, the conduct of Wolsey was far less exemplary than in his legislative functions; and were it not for the liberal views which he afterwards manifested in the promulgation of learning among the clergy, he would have merited from that body the severest reprobation. A new dignity was now added to the accumulated honours which Wolsey had gained. Leo the Tenth, desirous of establishing a league among all the princes of Christendom against the Turks, sent Cardinal Campeggio into England for the purpose of entering into a negotiation with Henry to that effect; at the same time the legate was empowered to collect a tithe from the English clergy, and to visit and reform the monastic institutions in this country. In order to conciliate the British monarch, Leo not only enjoined Campeggio to cultivate assiduously the friendship of Wolsey, but consented to invest the Cardinal of York with the legatine authority also; and Campeggio was detained at Paris, until a commission to that effect should arrive. This delay was suggested by the vanity of Wolsey, who both objected to admit any one invested with greater ecclesiastical power than himself; and who desired that Campeggio should be supplied with the means of supporting the dignity of his high office, which derived, in the eyes of Wolsey, additional importance, from his being joined with Campeggio as a colleague. With this design, a quantity of scarlet cloth was dispatched to Calais to supply the retinue of Campeggio with new attire, of which it stood in great need. This precaution having been adopted, and the bull of the pope received by Campeggio, that legate was permitted to

1518.

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* Holinshed's Chronicles, p. 615.
† Galt's Life of Wolsey, p. 209.

cross to Dover, and to enter London with the accustomed parade; yet Wolsey, not satisfied with the reported appearance of Campeggio and his train, sent twelve mules laden with baggage to increase the procession of his colleague. These chests were supposed to contain rich articles of jewellery, plate, and garments, of which the Italian legate was understood to possess a superabundant portion: but unhappily for the credit of Campeggio, one of the mules fell, and the coffer which it carried being burst open by the accident, old habiliments, and pieces of broken bread, or meat, put into the chest as ballast, were exposed to the spectators, too well disposed to sneer at the mock grandeur of the procession.*

Campeggio having paid his tribute of respect to the king, in company with Wolsey, the business of the legation commenced. No success attended the demand made upon the clergy, who refused to pay the tithe; and the visitation of the monasteries remained the sole object of the commission. On this subject it is probable that Wolsey had long formed his opinion, and that it was possibly his desire to effect his great designs without the fear of dissent, or interruption from a colleague. He dispatched Doctor John Clarke, therefore, to Rome, with a petition that the legatine power in England might be vested solely in himself, and that Campeggio might be recalled. The reasons assigned for this request related to the immoralities and ignorance of the clergy, which were enumerated by Wolsey in strong, and probably just terms. Doctor Clarke, acting both at the instigation of Wolsey, and by the command of Henry, proved a successful negotiator. He obtained a bull from Leo, constituting Wolsey legate *a latere*, with power to visit and to reform the monasteries and the clergy of England; and with the unusual and hazardous privilege of dispensing with all church laws for the term of one year after the date of the bull.† This extension of authority gave great offence to the bishops, whose powers it abridged; and was displeasing to the nation at large, who having already beheld Wolsey and Campeggio endowed with the privilege of granting remission for sins, after they had celebrated mass, deemed that the overweening greatness of Wolsey was dangerous to the people, and injurious to the honour of the king.

June 10, 1519.

Invested with authority which was likely to have an intoxicating influence over his own mind, and which was sure to excite the jealousy of others, Wolsey possessed not prudence, nor, indeed, integrity sufficient to defend him from the snares which sudden prosperity spreads for wisdom and virtue. His first act, as a legate, was to erect a court, in which a kind of inquisitorial jurisdiction was assumed over the clergy. Irregularities and offences, which had either escaped the cognizance of the law, or were not within its prescribed limits, were the objects of inquiry and of punishment at the new tribunal which Wolsey instituted. If the injustice and extortion imputed to him in the exercise of these functions be proved, the conduct of Wolsey in this department is more than ordinarily reprehensible, as the worst feature of the corruption which he had undertaken to abolish. The chief evidence against him in this respect is derived from the history of Polydore Vergil, a foreigner naturalized in England, whom Wolsey had rendered his enemy by committing him, for some offence, to prison. According to this writer, the legatine court was a scene of oppression and exaction of the most scandalous kind. All ecclesiastical persons, suspected of any misdemeanour, were summoned before the president, and were obliged, in many instances, to compromise, by large sums of money, charges from which they could not directly clear themselves. Executors of wills were called to severe account; livings in the gift of the nobility were given by Wolsey to his dependents; and the registration and proof of wills, hitherto the sources of profit to some of the dignitaries of the church, were now monopolized by the Cardinal.* John Aleyn, a priest, who was the person appointed by Wolsey to preside over the court, was, according to Polydore Vergil, a man of abandoned character, with whom all honest individuals dreaded to have any concern. These alleged abuses, which were repeated as accusations in the articles afterwards exhibited against Wolsey, in all probability existed to a certain extent.

The sense of justice which Wolsey manifested in all his other legislative functions, is at variance with the outrageous iniquities which he is affirmed to have countenanced; while, at the same time, his undoubted eagerness for gain may have acted, in some cases, as a counterpoise to the valuable and upright parts of his character. Wolsey was too much feared and hated to do evil without detection. Warham, archbishop of Canterbury, the constant, but temperate opponent of Wolsey's arrogance, informed the King of the reports which taxed his favourite with injustice and extortion. "Father," replied Henry, "no man is so blind as in his own house; I pray you, go to Wolsey, and tell him, if any thing be amiss, that he amend it." This command was obeyed by Warham, who disliked the innovations, as much as the insolence of his rival. The admonition of the primate produced, however, no other effect than that of increasing the hatred of Wolsey towards him; but the information which Warham had imparted to the king was not wholly inefficacious. It opened the eyes of the King to the fallibility of his minister; and some time afterwards, when Aleyn was accused of illegal practices, Wolsey received a severe rebuke from the king, for tolerating the conduct which he ought to have condemned. From this incident, according to the confident opinion of some historians of that period, the decline of Wolsey may be dated.*

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* Hall's Chronicles, p. 598.

† Herbert, p. 79.

* Henry's History of England, vol. xii. p. 11.

While these circumstances were gradually undermining his influence at home, it remained, to all outward appearance, undiminished; and, at foreign courts, his will was the pivot upon which all important operations moved. One leading principle, governing all the actions of the Cardinal, may be observed, from about this period, until all hope of attaining the object of his wishes was eventually precluded. He had been already exalted to a station, eminent beyond that which any former subject of a British monarch ever enjoyed; yet, like Alexander, he sighed for a new sphere over which he might extend his dominion; and the ambitious and restless ecclesiastic now directed his hopes to the papal crown. At what period of his life this desire was first kindled in the breast of the Cardinal, must be a matter of conjecture: but, perhaps, like many other aspiring men, the earliest yearnings of his soul for distinction were encouraged by a remote and apparently futile hope of attaining the highest point to which persons of his class and profession could arrive.

The principal influence among the conclave of cardinals, who held the papal election in their hands, was divided between France and Spain; and Wolsey was for some time undecided to which of these continental powers he should devote himself in expectation of assistance. Francis the First possessed fourteen votes in the conclave; he offered his interest to the Cardinal, and seconded his promises by presents and pensions. For some time Wolsey was disposed to adhere to the King of France, but wavered when he saw the young King of Spain raised to the imperial throne. The wisdom and energy already displayed by the young emperor, and the extent of his dominions, ensured to him a degree of importance in the affairs of Europe, which, as Wolsey easily foresaw, would eventually preponderate. The eagerness which Charles displayed to conciliate the British minister, his flattering epithets of "most dear friend," and his pension of three thousand livres, decided the choice of Wolsey, and he may from henceforth be regarded for some years as the secret and powerful ally of the Spanish court. His own mind being determined, Wolsey was not tardy in turning his master to the side of the young emperor; but Henry was constrained for some time to dissemble his intentions.

It had been agreed, in the treaty with France, during the preceding year, that an interview between the two kings should take place at an early period, within the English territory in France. Honour, policy, and inclination forbade the breach of this engagement on the part of Henry; nor was Wolsey reluctant to display to admiring France his greatness, as the proudest and most powerful subject in the train of his sovereign. The celebrated meeting at the field of Ardres, merits, from its novelty in the annals of Europe, and from its magnificence, the minute description which it obtained in some of our English chronicles, and in the lively memoires of the Marquis de Fleuranges, one of the nobles who accompanied Francis, and who was commanded by that monarch to commemorate the event. It was the last semblance of chivalry, which expired with Henry the Eighth, the festive diversions in the reign of Elizabeth being but the shadow of knightly prowess. It was the most splendid incident in the life of Henry, and Wolsey shared its glories and its luxuries. Precluded by his sacred office from a participation in those exercises which delighted the young and gallant monarchs, Wolsey, however, appeared in costly and pompous array, as was his usage on all festive and ceremonious occasions. It was his courtesy which directed the ornaments, his judgment which prescribed the regulations of the meeting. As a political affair, the personal communication between Francis and Henry was followed by no important effects. Their union was rather prevented than cemented by the event. The utmost courtesy and deference were, it is true, displayed on either part, both by the princes and their attendant nobles. Yet, in the midst of the most peaceful interchange of compliments and presents, the discerning spectator might have detected the secret aversion of Wolsey from an alliance with France; the ill-disguised distrust of the courtiers and people assembled on both sides; the irresolution of Henry, and the apprehension of Francis that his hold was insecure over the favour of his apparent friend. The scene must have been curious and interesting; unhappily it was soon to be followed by one of a solemn and afflicting character.

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* Herbert, p 81.

On quitting Ardres, Henry repaired almost immediately to Gravelines, where he was joined by the emperor, with whom an understanding had been already commenced in a visit which Charles had recently made to the King of England. Neither Henry nor Wolsey considered it any derogation from their honours to encourage the alliance of this rival of the French king, at the very time that every manifestation of friendship had been displayed towards Francis. The subtle policy of Wolsey was visited with retribution, and he sunk eventually into snares prepared by his own insincerity and vacillation. Engaged as he was with diplomatic manœuvres, his mind was also disturbed by the evident hatred and jealousy of the English nobles. Whilst the higher classes of the community outwardly paid homage to his rank and power, they secretly railed at the haughtiness, and recalled with contemptuous bitterness the lowly origin of the Cardinal. Among those highly born individuals, who, in those days of comparative darkness and ignorance, regarded no distinctions as worthy of consideration, except the accidental circumstance of ancient and noble descent, none looked with more indignant disdain upon Wolsey, than Stafford, duke of Buckingham. Allied to the family of Plantagenet both by the male and female line, the proud and aspiring character of the duke had even rendered the suspicion probable, that he was not without hopes of one day ascending the throne, in case of the king's death without issue: if Buckingham ever cherished treasonable designs, the birth of the Princess Mary must have dispelled all confident expectations of success. Previous to that event, he had, unhappily, been induced to hold conferences with those who first tempted him to the premeditation of guilt, and then betrayed his secret. Unconscious of the impending danger, Buckingham accompanied Henry to the field of Ardres, and shone there, one of the most splendid of the English courtiers, who, on that occasion, were said to have far surpassed the French in magnificence. Perhaps the very display which was in part intended to do him honour, exasperated the jealous frenzy of Henry. Shortly after the return of the king and Wolsey from France, Buckingham felt the effects of the gathering storm. He was apprehended, arraigned for high treason, tried, and condemned. His sentence, accelerated by the evidence of his dependents, produced universal regret among his fellow-subjects, and lamentation abroad.

Like all other passing events, the execution of Buckingham was imputed to the Cardinal. Even the emperor is declared to have said that the "butcher's dog had slain the finest buck in England." At home, it was supposed that a trifling incident had occasioned that bitter enmity in Wolsey towards the duke, to which his cruel fate was attributed. It was the custom for the highest of the nobility to hold the sacred water, present the ewer, and perform other offices of respect, at mass, when Wolsey assisted at the service. The more obsequious or more cautious courtiers submitted to the necessity which there appeared to be for these acts of humiliation, knowing and dreading the consequences of a refusal. Buckingham, however, inwardly chafed at the constrained semblance of reverence and even observing merely that Wolsey had the presumption to dip his hands in an ewer of water which the duke handed to the king, he could not brook the reflection that he had been involuntarily made to perform a service to a priest. Losing all self-command, he hastily and contemptuously poured the contents of the vessel upon the feet of the Cardinal. For this affront he swore that he would have his revenge, by sitting on the duke's skirts; a figure of speech more intelligible in the days of long trains than in the present time. Wolsey was, however, disappointed by Buckingham's appearing at court on the following day without any skirts to his coat, assigning as a reason for this new fashion that he was resolved to baffle the malicious designs of the Cardinal. For this childish and ridiculous warfare, if Wolsey be justly considered as the originator of Buckingham's ruin, the duke paid dearly. It is certain that, had Wolsey desired to rescue this proud noble from a degrading death, he possessed the power of saving him, for Henry, at this time, would have granted the privilege of mercy to his minister. It is perhaps unfair, however, to consider the conduct of Wolsey on this occasion as wholly dictated by the meanness of revenge. He may have deemed it a necessary act of caution to check, by the death of Buckingham, those aspiring views in the nobles allied to the crown, by which the peace and security of the country might be troubled.

There is reason also to believe that Buckingham was not entirely guiltless of the designs imputed to him; and the example of his father, who had once meditated asserting a claim to the English crown, was not obliterated from the recollection of the public. The most discreditable feature in the proceedings against him was the care taken by Wolsey to procure the absence of those friends and relatives of the unhappy duke, whose intercession might have averted his fate. Twenty-six peers only sat on the trial; and the sentence was pronounced with tears by the Duke of Norfolk, too subservient a courtier to decline this sad office, although the personal friend of the prisoner. Some indications of mercy were manifested on the part of the king; and while his obnoxious measures are imputed to the influence of Wolsey, it is but fair to ascribe to the same source those which betokened a milder spirit. The decree by which the punishment of hanging was adjudged to Buckingham, was changed into the sentence of decapitation, and part of the forfeited estates were restored to the eldest son. Popular feeling was, however, in a state of unabated irritation against Wolsey, for some time after the death of Buckingham. The galling remark, that a "butcher's son must naturally delight in shedding blood," and other effusions of public resentment, were probably neither unfelt nor unobserved by the Cardinal; and he found, perhaps, relief from some annoyance in the mission which he was at this time induced to undertake, with the avowed object of composing the differences now verging towards hostility, between the emperor and the king of France. 1521.

The actual end to which the exertions of Wolsey were directed in the negotiation was to form a confederacy with Charles against Francis on the part of England; and, on his own account, to obtain a promise from the emperor, in case of the decease of the reigning Pontiff, to aid his long-cherished wishes on that point. Charles readily, but without sincerity, accorded the favour requested; secretly resolving, as his subsequent actions proved, to suit his own convenience in the result. A treaty was concluded between the pope, the emperor, and the king of England, to the exclusion of Francis, against whom hostilities were meditated.

Chapter Third.

The part taken by Wolsey in the Controversy between Henry the Eighth and Luther.—His desire for the Revival of Learning.— His Schemes with respect to the Monastic Institutions.— Erection of the Cardinal's College at Oxford.—His Regulation of the Royal Households.—Embassy of the Cardinal to France.—His decline in the favour of Henry.—The Great Seal taken from Wolsey.—His Humiliation,— Impeachment, — Illness,—Death, — Character,—Burial.

It is necessary to take a cursory view of the life of Wolsey at this period, in order to arrive at those benevolent designs, and at the great though imperfect achievements which constitute the real glory of this celebrated man; and which afforded a far nobler exercise for his genius than the diplomatic intrigues in which he played a conspicuous, but an unworthy part. It is, however, to be regretted, that he was allured by the voice of ambition, while he cherished the schemes of a philanthropist: yet a more cautious 1521.

and less aspiring individual would never have projected, under existing circumstances, the reformation which he commenced; and, while the pride and ambition of Wolsey are to be reprobated by the moralist, it is to them that we owe the results of that power, which would scarcely have been the portion of Wolsey, without the agency of these passions.

It was at this æra that the famous controversy between Henry the Eighth and Luther attracted the criticisms of the learned, and the attention of all classes. Wolsey was not engaged in this affair, otherwise than as being one of the objects of the vituperation in which the great reformer occasionally indulged. Described by Luther, in one of his celebrated letters, as "a favourite, a monster, a person hated both by God and man," Wolsey might possibly find his zeal for the interests of the hierarchy increased by the invectives against himself, which were coupled with just, though vehement reprobations against the corruptions of the church. Want of leisure, and perhaps want of inclination to enter the lists with so powerful an adversary, deterred the Cardinal from hurling back the epithets bestowed upon him. Contented to leave his cause in the hands of his royal master, who defended the character of his favourite, in his reply to Luther, Wolsey took no vengeance, except in issuing a commission, commanding that the works of the reformer should be collected in each diocese, and delivered to him by the bishops. Having thus extracted the supposed poison from the people, he resolved to distribute the antidote. He ordered forty-two of the doctrines advanced by Luther to be posted upon the church-door, in every parish, that all persons might read and avoid these "damnable and pestiferous errors," as they are described in the commission, which also declares them "to have taken root as a noxious brier." This proceeding sullies the reputation of the Cardinal as a man of judgment and experience. It was natural that he should think harshly of Luther, and seriously of the mischief, which, as a zealous papist, he might believe to result from the opinions he had denounced: but when the intemperance of zeal had subsided, it might occur to Wolsey, that thus to afford matter for thought and speculation was to give the first impetus to schism. It is, however, probable, that he acted, in this instance, in conformity with the wishes of the king, who, by his edicts, his disputations, and vacillations, adopted the most effectual means that could have been devised for propagating a love of inquiry, and encouraging the desire of reform.

Wolsey soon proved that his notions concerning the real danger of the church were enlightened, and his plans for its benefit founded upon just and liberal principles. He saw that the majority of christian philosophers and scholars leaned to the side of the reformers; embraced their simple, but rigid persuasion; increased its growth by the influence of their writings, and honoured it by the purity of their lives. He beheld, on the other hand, the professors and dignitaries of the Romish church, obscured in intellect by the speculative and confused studies in which they were trained to glory, and degraded in conduct by the irregular and voluptuous courses in which they indulged.

To oppose "learning to learning," by encouraging a spirit of laudable exertion, to raise the meritorious members of the church into notice, appeared to the Cardinal to be the only mode by which the declining power of the hierarchy might be sustained. To this end he determined to restore the English universities, now drooping from the indifference of their teachers, to that rank of importance for which they were originally designed among the institutions of this country. Happily for England the services of Wolsey were ensured to her by the frustration of all his hopes of obtaining the papacy. Leo the Tenth expired, as it is said, of a fever produced by joy, upon hearing of the success which attended his army engaged in warfare with the French. Upon this vacancy, it was naturally the expectation of Wolsey to ascend the pontifical throne, through the interest of Charles the Fifth; but in this he was deceived. Charles had little inclination to throw, into the balance of power, a proportion in the scale so advantageous to England as the exaltation of its minister to the highest dignity in Europe. The emperor had also his own favourites, whom he desired to aggrandize; and Adrian of Tortosa, his former tutor, was elected pope before Doctor Pace, the emissary of Wolsey, could reach the scene of contention. This annihilation of all his hopes was, probably, in the mind of Wolsey, conclusive; and although these were not his last efforts to obtain the papacy, it is likely that he considered this manifest declaration of the intentions of Charles to be an insuperable barrier to his wishes. His ambition may be deemed, therefore, from this time, to have centered in his country, and his schemes of public utility to have regarded her interests alone.

In surveying the condition of the church at this period, Wolsey perceived that, to destroy the corruption which infected the stem and branches of the tree, it was necessary to promote the healthy condition of the root. He regarded education as the soil in which religious knowledge might be restored to vigour. Hitherto the instruction of the young had been confined either to a few great public schools, to the monastic institutions, or to the humble exertions of parish clerks. The higher orders of the clergy received into their houses, it is true, as pupils, in some instances, the sons of noblemen or of gentlemen, on terms the most advantageous as far as private tuition was concerned; but opportunities such as these were afforded only to the sons of the great and opulent; whilst the middling classes of the people, from whom the clergy principally sprung, were wholly destitute of those incentives and those aids to learning, which, in our happier days, they eminently enjoy.

At an earlier period of his career, Wolsey had evinced his zeal for the revival of literature, and his sense of the inefficiency of those who were deputed to maintain its reputation, by an address to all the schoolmasters of England, exhorting them to introduce the classics into their plan of education.* He had afforded his patronage to the institution of St. Paul's School, by Doctor Colet, in 1509, and had devoted a particular attention to the structure and regulations of that valuable seminary, the first which was founded in England by any private individual; but the English universities demanded and received the first and most sedulous care of the Cardinal, and he viewed with regret and anxiety the diminution of honour and importance now attached to those venerable resorts of the studious and the learned.

It was apparently an accident which directed the notice of Wolsey to the degraded and impoverished condition of the colleges at Oxford. In 1518, the king, and queen Katharine, being on their progress, at Abingdon, a visit to Oxford was planned by the pious and intelligent Katharine, who desired both to offer her tribute of respect at the famous shrine of the virgin St. Frideswide, and to see the university. Wolsey, who was with the royal pair, accompanied Katharine in this excursion, and remained at Oxford after the departure of the queen. Upon this occasion he made an oration in the Convocation House, declaring it to be his intention to establish fresh lectures in the university, and to apply to the king in its behalf. The heads of the colleges then delivered their charters and liberties into the hands of the Cardinal, and Wolsey, shocked at the irregularity, confusion, and even dishonesty which an exposition of the affairs of the university displayed,* resolved to spare neither trouble nor expense in dispelling the gloom which negligence or knavery had thrown over the scene of his early studies.

Agreeably to his promises, Wolsey made an earnest and early application to the king in favour of the declining yet indispensable institutions of Oxford, and Henry was disposed to enter warmly into a course so accordant with his own reverence for philosophy and letters; but the power of granting pecuniary aid for the noble purpose of restoring the decayed colleges to their former prosperity, had passed away from the king, and the expenses of foreign wars and negotiations, and the costly maintenance of a dissipated court, had left no sums in reserve to promote the extension of knowledge. New and more abundant resources were, however, in store; and Wolsey had sufficient courage to resort to them, and address and wisdom to employ them with advantage.

The monastic system had for some time begun rapidly to decline in public estimation. Several of the most exalted and rigid of the English bishops, had viewed the corruptions which prevailed in religious houses with concern, and had preferred the endowment of colleges to the establishment of new monastic institutions. Reprobated, and in some individual instances suppressed by authority, the monasteries had hitherto possessed some degree of popularity, from the convenience which, in some respects, they afforded, and, among the benefits they produced, none were with so much reason insisted upon by their advocates, as the facilities which they gave to the preservation of learning, and to the instruction of youth.

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* Strype's Ecclesiastical Memorials, vol. i., p. 192.

* Wood's History of Oxford, vol. i., p. 606.

The condition of society was now, however, materially changed. The art of printing, which had flourished peculiarly in this country, had rendered the intellectual part of the community in a great measure independent of the laborious exertions of the monks, one of whose chief employments consisted in the transcribing of books. The foundation of several grammar schools, since the year 1503, and the increasing fame of Eton and Winchester, had superseded the instructions of the convent schools, which had hitherto attracted the greater portion of young students within the walls of their establishments.

These considerations, and others of too extensive a nature to be here detailed, may appear to have greatly facilitated the design which Wolsey now cherished of diminishing the number of the monasteries, and of turning their revenues towards objects more conducive to the public good, than the continuance of these corrupt and ill-arranged fraternities. But the task which Wolsey contemplated was fraught with difficulty, and attended with odium. For this great scheme, for the motives by which it was suggested, and for the effects which followed it, if Wolsey obtained not the suffrages of gratitude from his contemporaries, he has merited the veneration of all successive generations of his countrymen.

The extraordinary power which he at this time enjoyed, could alone have enabled him even to plan, with any rational hope of success, the dissolution of forty-one monasteries, which he effected in order to form a fund for the erection of new seminaries of learning. It was at first the intention of the Cardinal to have exerted simply his own authority as legate, in the suppression of those convents which were most notorious for irregularity and licentiousness; but from this measure he was dissuaded. Accordingly he applied to Pope Clement the Seventh, who had succeeded Adrian, for a bull, empowering him to suppress the monastery of Saint Frideswide, in Oxford. In 1524 he obtained the object of his petition; and in 1525, another bull, granting him permission to dissolve forty small monasteries.* In the visitation of the proscribed institutions, it was the folly or ill-fortune of Wolsey to employ the same individual that had already rendered the legatine court obnoxious by his arrogance and extortion. Represented by such a deputy, Wolsey experienced not only interruption from the lower orders of the people, who generally espouse the cause of the suffering party, but reproof from the king, who admonished him in strong but friendly terms, to avoid giving all future occasion to the "mumbling" and "murmuring" which pervaded the realm, upon the innovations which Wolsey had commenced.*

Undismayed by these checks, Wolsey proceeded to the application of the funds which the dissolution of the monasteries supplied. In 1525, the monastery of Saint Frideswide was despoiled of its revenues and endowments, its once flourishing community dispersed, and its buildings in part appropriated to the formation of a "College of secular priests," as Wolsey at first intended to designate his infant establishment. With systematic care, the Cardinal had already prepared students for his projected college, in his native town, at Ipswich, where, two years before, he had founded a school. In this tribute of gratitude to his birthplace, Wolsey had received great assistance. The magistrates of the town had wisely resigned the property vested in their hands for the maintenance of an ancient school to the Cardinal, whose power of appropriating them efficiently they knew to be superior to their own;† he was afterwards enabled also to add the revenues of twenty-four small monasteries to the means already stated. The regulations of the school he took also under his own charge, and framed them upon the model of those adopted at St. Paul's, by the excellent Colet. He even published, by his authority, a grammar, for the use of his Ipswich scholars, with a preface composed by himself,—the only effort of his pen in matters not connected with state affairs, or private business. But the grammar-school of Ipswich, being solely of local importance, survived not the hand by which it was founded; and this short-lived institution sunk, with Wolsey, into neglect and oblivion. The circumstance of its erection affords a pleasing proof of Wolsey's attachment to the scene of his childhood; and, if it be true that the insignia of a butcher's trade were carved upon one of its portals,[*] it furnishes evidence, not only of Wolsey's actual origin, but of the far more important fact, that he was superior to the littleness of remembering that origin with shame.

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* Collier's Ecclesiastical History, vol. ii., p. 19.

* Wood's History of Oxford, edited by Gutch, vol. iii., p. 417, dissertation 6.

† Galt's Wolsey, p. 208.

The magnificent institution of the Cardinal at Oxford has obtained a more lasting celebrity than his inferior but equally meritorious design. Retained to us in the present day in the imposing structure of Christ Church College, this establishment sustained, in its infancy, curious and even threatening vicissitudes. In March, 1525, Wolsey laid the first stone, on the site of the former monastery of Saint Frideswide, the ceremony being solemnized by a sermon from Longland, Bishop of Lincoln, and enlivened by a sumptuous entertainment. The stone for the building was procured from quarries in the vicinity of Oxford; yet such was the extent and solidity of the masonry, that the expenses consumed in it amounted in one year to eight thousand pounds, a very considerable sum in those days. The church was adorned by Wolsey with a steeple, and a fine roof over the choir; but part of the edifice was taken down, in order to afford space for the erection of the choir. The endowment of the college with a dean, canons, and professors, was planned with liberality, and with a judicious attention to the real interests of religion and of learning. But Wolsey was not permitted to complete an undertaking which reflects the brightest lustre upon his prosperity. In his subsequent misfortunes, anxiety for his infant college, and concern for the deserted state into which it fell, formed one of the most painful sources of his frequent reflection. Henry eventually re-
1532. stored it; but monopolized to himself the glory of its existence, by assigning to it the name of King Henry the Eighth's College. It was, for various reasons, endowed, in 1545, by the appellation by which it is now designated.

It affords a curious and instructive picture of the mind of Wolsey, to turn to the varying occupations in which he was engaged, even while he was called upon to effect that great change in the character of the country at large, produced by the dissolution of the monasteries. The people beheld him with astonishment descend to the direction of the royal children in the minutest particulars; and devote his energies alike to the regulation of a household and of a nation. The Duke of Richmond, the natural son of Henry the Eighth, and the Princess Mary, presumptive heiress to the crown, were alike intrusted to the charge and superintendence of the Cardinal. On the duke, who was his god-child, Wolsey bestowed sedulous and judicious attention, which was repaid by the merits and early proficiency of the
young nobleman. With a 1525,
careful hand Wolsey framed 1526.
the household of Richmond, as soon as his godson had attained the age of six years: the regulations by which the miniature court was governed were dictated by the judgment, and subscribed in the handwriting of the Cardinal.[*] In a manner nearly similar, Wolsey arranged the establishment of the Princess Mary, and lent his great understanding to determine whether or not the princess should have "spice plates and dishes of silver;" and if a "trumpet and rebeks" were to be permitted for the solace of the young lady, or rather of her attendants.[†] Undaunted by the sneers of those who forget the importance of trifling details in the sum of human happiness, Wolsey next undertook the weary task of effecting a reformation in the ill-arranged and ill-governed household of the king. The particular abuses which he had to correct, are enumerated in a document entitled the "Statutes of Eltham;"[‡] and they afford an amusing picture of the peculiarities of Henry, and of the manners of his court. The correcting hand of Wolsey was, of course, unwelcome, and unpopular; and, as is customary in the operations of a domestic revolution, the most arduous offices were the least approved. Among the numerous, indolent, and self-willed dependents, whom it was the duty of the Cardinal to eject from the service of his royal master, many enemies were added to those by whom Wolsey was already abundantly assailed.

The Palace of Hampton, nearly completed by Wolsey in the pre-
ceding year, was now pre- 1526.
sented by him to the king, the most splendid gift ever proffered

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[*] Warton's History of English Poetry.

[*] Harleian MSS. in the British Museum, 569, 192.

[†] Ellis's Original Letters, vol. i., p. 271.

[‡] Archæologia, vol. iii., pp. 157, 158.

by any English subject to his sovereign. Wolsey, by this act, sought to evade the attacks of the envious and insidious courtiers, to whose snares he was exposed; but his discretion, in this instance, availed little. Henry, touched by the generosity of the Cardinal, gave him, in return, the ancient manor of Richmond, a favourite residence with the English kings, and especially with Henry the Seventh, by whose command its appellation was changed from Sheen to Richmond, in compliment to his title as Earl of Richmond in Yorkshire.* In this agreeable abode Wolsey kept his Christmas, in a manner far superior in splendour to the royal court, which was held at Eltham privately, on account of the sweating sickness. It was at once irritating to the nobles, and to the populace, to see the "butcher's dog," as they contumaciously expressed it, living in a royal residence. The unpopularity of Wolsey was, indeed, general. Already had they resented with bitterness the attempt made by the king, and attributed to the Cardinal, to raise a sum of money from the nation under the form of "a benevolence." The prohibition of games of chance increased the public irritation., A less judicious act of authority inflamed the passions of the people to the highest degree, whilst it proved that Wolsey possessed not that command over his own temper which it should be peculiarly the endeavour of a lawgiver or a ruler to acquire. In a play, or, as it was then termed, "a disguising," enacted by the young lawyers of Gray's Inn, a plot was introduced reflecting apparently upon the existing state of public affairs. The piece had, however, been written twenty years before the performance, and it might have been applied, from the general nature of the characters, by any minister in any times. Wolsey thought otherwise, and attributed the invention of this drama to hatred against himself. Under pretext that the king was highly offended with the piece, he committed John Roo, the author, to the Fleet Prison, and deprived him of his office of serjeant at law. The young performers were severely reprimanded, and one of them, who had figured as the principal hero of the piece, was threatened with imprisonment. Popular and ill-suppressed murmurs followed this arbitrary measure. "He who grudges every man his pleasure," said the people, spares not his own."

Events soon occurred, which afforded ample encouragement for expressions of a still more decided nature. A singular revolution had been for some time working in the affections and opinions of Henry the Eighth. He who, in the commencement of his reign, had deemed the decisions of the pope inferior only to those of heaven, and had recently upheld the papal power in his controversy with Luther; he, who had hitherto afforded to his subjects an example of conjugal felicity, began now both to question the authority of the pope, and to entertain the intention of repudiating his wife. When this change first began to operate on the mind of Henry; by whom or in what it was originated, and what share Wolsey had in effecting it, are points which have been variously stated by historians. It appears evident, that whatever may have been the sentiments of the Cardinal respecting the divorce, love, and not the counsels of the minister, suggested that measure to the ardent monarch. It is also undoubted that Wolsey viewed with chagrin and alarm the ascendency which the beautiful and accomplished Anne Boleyn had now acquired over the affections of the king. Before the temptations of ambition had weaned her from tenderer and more natural emotions, Anne had experienced the bitterness of disappointment in that "course of true love" which is said never to "run smooth," nor to return a second time to the channel of our affections. She occupied the place of maid of honour to Queen Katharine, while the young Lord Percy, son and heir of the Earl of Northumberland, attended in the household of Wolsey, for the purpose of instruction, among other youths of birth and fortune, who have been already described as a part of the Cardinal's establishment. It was the business of Lord Percy to await the pleasure of the Cardinal at court, where the hours of idleness and attendance were passed by him in Queen Katharine's chamber in pastime with the attractive, and, at that time, light-hearted Anne Boleyn. This casual circumstance had a considerable influence on the destiny of Wolsey; so wonderfully do the most trifling occurrences operate on great events. A mutual understanding soon took place between these two young and thoughtless persons, who were destined to experience the folly of cherishing schemes of domestic happiness in courts. Their attachment was soon perceived, and was highly displeasing to the king, who, hastening to Wolsey, entreated him to frustrate the projected engagement, revealing, at the same time, his own secret partiality for the fair mistress of Lord Percy. Wolsey, in consternation at this discovery, was yet too well acquainted with the character of Henry, to hesitate complying with his commands. The lovers' vows were, at his interference, and upon the interdiction of the Earl of Northumberland, irrevocably cancelled, and the hero of the adventure constrained to enter into a contract of marriage with a woman whom he loved not. Anne never forgave the Cardinal for his part in this affair, and, upon her return to court after a temporary retirement, became his determined though not avowed enemy.

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* Lysons's Environs of London, p. 443.

Those courtiers and privy councillors who beheld with satisfaction the predilection of the king for Anne Boleyn, formed a party against Wolsey, who fell the victim of their machinations. To remove him from the presence of the king became the object of Wolsey's enemies; and a favourable opportunity for the execution of this design was furnished by the singular crisis which had recently taken place in the affairs of Europe.

The balance of power, long supposed by Henry the Eighth to owe its conservation to his own political skill and influence, began now to lean to the side of the emperor. Francis the First, lately released from a degrading imprisonment; the pope Clement the Seventh still a captive in the castle of Saint Angelo; and Henry, impoverished by the bad management of his financial concerns, offered but a feeble opposition to the power of Charles. To negotiate personally with the king of France was the task now intrusted to the Cardinal, whose abilities and accustomed grandeur rendered him an efficient and an imposing representative of his sovereign. Accordingly, when the splendid preparations which he deemed necessary were completed, Wolsey set out, on the 3rd of June, 1527, with a procession similar in its arrangement but superior in numbers and in magnificence to the train with which he usually journeyed. In his way to Canterbury he rested either at the houses of the nobility, or at the larger abbeys; for in those days inns were both rare, and unfit for the reception of guests of the higher classes; farm-houses, convents, and the mansions of the great supplied the place of those establishments which are now indispensable to the traveller; and however the independence of the visitant might be compromised by the obligation received, his comforts were probably ensured by the substitute. At Canterbury the Cardinal was lodged in the abbey of Christ Church, where he waited for three or four days, in order to celebrate the festival of St. Thomas, the patron saint of the abbey. Here Wolsey signalized his devotion to the imprisoned pope, by commanding that the litany, sung on the feast day, should contain an appeal to the Virgin in favour of Clement. Kneeling at the door of the choir, the monks and choristers standing in solemn array in the body of the abbey, Wolsey was observed to shed tears of pious grief, on account of the captive pontiff to whose honours he had but recently aspired. May we not conjecture that some mournful presentiment, some sad misgivings with respect to his own reverse of fortune, might mingle with that sorrow which was attributed, by the spectators, only to compassion for another?

1527.

After a fatiguing passage, Wolsey reached Calais, which he entered in solemn procession, first performing his devotions in the portal of the Lantern gate, before he entered the town. Here he rested some days, from indisposition; but, after all his train and carriages were landed, pursued his journey towards Boulogne, first addressing his attendants on the propriety of caution in their intercourse with the French nation; towards whom strong national distrust was harboured even by the experienced and liberal Wolsey.* After this exhortation, he proceeded to Boulogne, and thence to Montreuil and Abbeville; honoured, on his passage through those towns, with processions and pageants, which he repayed as he went, by proclaiming certain days of freedom for sins, a mode of remission on which even intelligent and devout men were disposed, at that time, to rely. Wolsey was empowered by Francis to distribute temporal forgiveness to the offenders confined in the prisons of the various towns through which he passed; a privilege hitherto vested solely in the monarch, who usually exercised it during his progresses.†

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* Cavendish, p. 155.

† Singer's Cavendish, p. 158.

From Abbeville, Wolsey travelled onwards to meet Francis, and crossing the river Somme, he rested for a short time at the castle of Picquigny. From this romantic abode, which was thought, by his English followers, to resemble Windsor, Wolsey hastened towards Amiens, and meeting Francis near that city, he and the king entered it together, "making," as Cavendish, who was an eye-witness, observed, "such wonderful cheer one to another, as if they had been of an old acquaintance." At Amiens, Francis and Wolsey remained for a fortnight, which they spent in banqueting and in consulting; concluding the more serious part of their occupations with a compact, solemnly implied in the mutual participation of the sacrament, between the king of France, and Wolsey, on the part of the king of England. At Compiégne, whither they afterwards repaired, a still closer intimacy was formed between the French king and the English minister; but Wolsey was too much of a veteran in politics to allow his courtesy to interfere with the interests of his embassy. The chancellor of France, having on some occasion offended him, Wolsey gave way to a paroxysm of anger, which it required all the address of Louise, the mother of Francis, to allay. By this manœuvre the Cardinal gained some concession in the negotiation which had hitherto been withholden, and he established his ascendency over the French council, whom Cavendish describes as "having their heads under his girdle."

After witnessing, among other diversions, that of a boar-hunt, a novel scene to the Englishmen, Wolsey prepared to return, wearied with these courtly revels, and disgusted with the knavery and ridicule of the French, who both insulted him with derision, and robbed him of plate and furniture. At home, mortification of a more serious nature awaited him, and he experienced a cold reception from the king, whom he joined at the house of Sir Henry Wyatt, in Kent; nevertheless he remained for some days with the court, and then adjourned to his own mansion, at Whitehall. Shortly afterwards he resumed the trust of the great seal, which had been assigned by letters-patent to the guardianship of Doctor Taylor, master of the rolls, during the absence of Wolsey; the laws of England not permitting that this important instrument should be carried without the realm. A meeting of the nobility and great law officers being held in the Star Chamber, Wolsey unfolded the result of his late mission, and announced the approaching arrival of a grand embassy from France. In this harangue the Cardinal boasted of the benefits which would accrue from the alliance about to be concluded between France and England: he extolled the splendour of the embassy which should complete this important measure: unhappily, the distinguished persons of whom it was composed, were decreed by chance to behold his ruin.

Early in October, the metropolis was enlivened by the arrival of five French noblemen, among whom was Du Bellay, bishop of Bayonne, a man of lively observation, and to whose letters, published by Le Grand, we are indebted for many interesting particulars of the strange scenes which he witnessed during the continuance of his mission. For some time after the appearance of the ambassadors no symptoms appeared of the alienation which Henry afterwards displayed towards his minister. On the conclusion of a treaty of peace between the two states, the Cardinal celebrated mass in presence of the king, of the foreign noblemen, and of an assemblage of the chief persons of rank or power at the English court. The king, after his usual custom, rode home to dinner with the Cardinal, and even arranged that Wolsey should provide a banquet at Hampton Court, to regale him and the ambassadors, after hunting the next day in the royal park at Richmond. All was now bustle and preparation in the household of Wolsey. The caterers and purveyors procured the finest viands they could get for "money or friendship, among my lord's friends."* The cooks wrought both day and night; the yeomen of the chambers were busied in hanging the apartments of the stately edifice with costly draperies, and in furnishing them with silken beds. There was carriage and re-carriage of plate; for the fashion of having cupboards or sideboards with several compartments, in the banqueting room, required a rich and often inconvenient display of that costly article, then doubly precious from its recent introduction. The splendour of the scene was made wholly visible by two immense candlesticks of silver, valued at three hundred marks each, holding torches. the light of which was reflected by large plates of silver gilt. The viands and the wines equalled the decorations in richness and excellence; and the tenour of the entertainment was, to all appearance, such as to satisfy the most fastidious guests, and the most anxious and punctilious host. Yet while some envied and all admired the magnificence of the Cardinal, secret and corroding care filled his breast,—for the king danced with Anne Boleyn; and it was on this occasion that Du Bellay observed that public attention was first riveted upon the passion which Henry could not conceal, and which Wolsey could not but dread. It was not long before the unfortunate minister received a full confirmation of all his fears; and the embarrassing question of the divorce was explicitly unfolded to him by the king. Long and earnest were the entreaties and arguments which Wolsey urged, to dissuade him from the project of paving the way to his marriage with Anne, by a divorce from the virtuous and respected Katharine, whose infirmities of constitution, and decline in personal charms, had far more influence in deciding her consort to adopt this measure, than the plausible, but equivocal plea of conscientious scruples concerning the validity of his marriage.

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* See Cavendish.

The conduct of Wolsey throughout the whole affair of the divorce has been variously represented; but little can be pronounced with certainty upon his real opinions and motives. When the peculiar circumstances to which he was obliged to yield are considered, and the character of the monarch whom it was certain ruin to displease, is recollected, it is probable that, in the first stage of the business, the divorce was approved by Wolsey, and that his actions may have been influenced by enmity to the Emperor Charles, the nephew of the Queen, and his devotion to the interests of Francis, who desired an union between the Princess Renée, his sister-in-law, and the King of England. The most partial admirers of Wolsey cannot represent him with justice as a man rendered inaccessible, by a high sense of honour, to considerations of personal interest, or even of personal feelings. When the dispositions of Henry in the affair were developed, and when Wolsey found, that, instead of strengthening his foreign connexions, he was assisting in the elevation of a domestic enemy, he was seized with consternation, and endeavoured, too late, to recede. He could not fail to perceive what was obvious to a less interested observer, that whichever way the question terminated, it would involve his ruin.* Anne, whether raised triumphant to the throne, or dejected by defeat, would still remain his enemy; and Wolsey, who affirmed of the king that "he could never persuade him from his will and appetite," knew well the effects of female influence upon that susceptible, yet brutal monarch.

From this time the fate of Wolsey was decided, as far as it is permitted to human agents to determine the lot of a fellow-mortal. He sought, indeed, to avert the coming storm, and to throw all responsibility from his own shoulders, by an appeal to the English and foreign universities concerning the validity of the divorce; and he persuaded Henry to demand the opinions of the bishops on the momentous question. Unfortunately for Wolsey, each of these applications to clerical subserviency was favourable to the divorce; and Henry, emboldened by this partial success, rested not until he had obtained from Clement the Seventh a bull, empowering Cardinal Campeggio and Wolsey to hold a legatine court, in which the cause nearest his heart might be heard, and determined. The result of this proceeding hastened the ruin of Wolsey, and his conduct in the matter was never cordially forgiven by Henry. Averse, as a zealous, though liberal Catholic, from a process which impugned the validity of the papal dispensation, which at no very distant period had permitted Henry and Katharine to marry, Wolsey felt the strongest inclination to defer, or to decline the decision required from him and Campeggio; and at the close of the memorable and singular trial, he evinced the same disposition in which the validity of the marriage was argued. It was the lot of Wolsey to be obnoxious to both the parties by which the court and country were at this time divided. The partisans of Anne were his most powerful enemies; but the advocates of Queen Katharine's cause were equally clamorous against him. Harassed and perplexed, he endeavoured to justify himself, through the king, from any participation in the first suggestion of the divorce, which report ascribed to his counsels, conveyed, it was affirmed, to the king's ear by his intimate friend, Longland, the royal confessor. The solemn asseveration of Henry, before the legatine court, that Wolsey was guiltless of the unpopular measure, received little credence. Katharine, whom it was the office of Wolsey and his colleague to visit and to conciliate, expressed with the ingenuous warmth of a fearless and exalted mind, her unshaken conviction of his secret enmity, and of its fatal effects. Yet, if this accusation were just, the conduct of the Cardinal when he had the whole affair of the divorce in his own hands, is incomprehensible. Instead of hastening the conclusion of a measure of which he was himself supposed to be the first originator, he deferred the decision of the king's appeal from day to day, until the impetuous temper of Henry could no longer brook delays which he deemed unnecessary. The vacillation with which for the first time the Cardinal acted, is wholly unaccountable, except upon the supposition of some secret change in his private sentiments upon the point in agitation. Distracted and bewildered, he betrayed a lamentable deficiency of that manly resolution, so characteristic of his nature, which might have availed something even with Henry, and which would have redeemed him from the utter degradation that attended his fall. The unhappy Wolsey now experienced the bitterness of a servitude in which opinion at least, if not conscience, is at variance with interest. Well might he afterwards regret, with the bitterness of an unavailing, because a late repentance, that his days had been devoted to an earthly, rather than a heavenly Master. Well might he contemn the vanity of human desires, when he reflected on the peaceful tenour of a life, unruffled by the turmoils of ambition, free from those shackles which the lust of power forges, and passed in rendering, as offerings to heaven, works of active benevolence to man.

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* Le Grand.

Formed by nature for a nobler sphere than the court of a capricious and pampered tyrant, the spirits of Wolsey began to sink under the accumulated annoyance inflicted by the ill-suppressed triumph of insolent enemies, and the indulged fury of the king. At the close of the court one day, Henry sent for him to his residence at Bridewell, and he remained in the private apartments of his sovereign for more than an hour. At the end of that time the Cardinal entered his barge at Black-Friars, and went to his own palace at Westminster. The Bishop of Carlisle, who was with him in the boat, remarked that "it was a very hot day." "Yes," replied Wolsey, "and if you had been as much chafed as I have been within this hour, you would indeed say it were very hot." Upon entering York House, the Cardinal hurried to bed, but was not long permitted to enjoy repose, for the Earl of Wiltshire was obliged soon to rouse him, with a message from the king, requiring the immediate interposition of Wolsey and his colleague, with the queen, who was then at the royal abode. Fatigued and harassed as he was, the Cardinal could not delay complying with this order, and accordingly returned to Bridewell, where he had to encounter the resentful demeanour of the queen; and this day of anxiety and mortification was terminated by another interview with Henry, to whom he could communicate nothing but the inveterate determination of Katharine against yielding to her fate.*

These occurrences were succeeded by a quarrel between Wolsey and Brandon, Duke of Suffolk, the intimate associate of the king. It was a plain intimation of the temper of Henry, when Brandon, an experienced and dexterous courtier, ventured to attack the minister, once so formidable, and once his friend, to whom he many times had owed kind offices of mediation with the king. The enemies of Wolsey were becoming daily more numerous and confident, when Henry prepared to set out on his summer progress, accompanied by Anne Boleyn, and breathing all the violence of his furious nature against the two legates. His indignation was excited to the utmost by the adjournment of the legatine court until Bartholomew-tide, a measure adopted by the two legates, in order to avoid the necessity of a decision, but under the pretext of a similar regulation in the courts at Rome.

Campeggio, weary of his office, and anxious to return to Rome, determined to leave the conclusion of this tedious process to other hands; and finding that the mission of Stephens, the king's secretary, who had been sent to Rome to obtain from the pope authority to pronounce judgment, had been fruitless, he resolved to follow the king on his journey, in order to signify his departure, and to take his leave. He was joined in this excursion by Wolsey, and the Cardinal, on this occasion, beheld, for the last time, the monarch over whose mind he had exercised, for many years, an influence unparalleled, and almost absolute. His ruin appears to have been generally expected before the final explosion of the king's anger; for, on the arrival of the two cardinals at Grafton, in Northamptonshire, where the court rested, there arose, as Cavendish avers, "divers opinions that the king would not speak with the lord cardinal, and thereupon were laid many great wagers." On reaching the entrance of the court, Campeggio was immediately conducted to an apartment prepared for him, and Wolsey, after having accompanied his colleague to his chamber, expected to be led to his own, but he was struck with dismay on hearing that no orders for his accommodation had been issued. In this dilemma, the courtesy of Sir Henry Norris, a young and favoured attendant of the king, relieved, in some degree, the perplexity of the Cardinal. Norris, who was afterwards executed upon a charge of supposed criminality with Anne Boleyn, evinced, in this instance, a delicacy and kindness of feeling which proved him deserving of a less tyrannical master, and of a happier fate. Affecting to ascribe the manifest neglect of the Cardinal to the limited establishment of the king's present residence, the knight begged that Wolsey would accept his own apartment, an offer which the dejected favourite accepted with gratitude, and, while he changed his riding apparel, gained from Norris such details of the king's expressions towards him of anger and alienation as were current about the court. Thus warned, Wolsey was the better prepared to enter upon his defence, if opportunity should be allowed, in a place where he had few friends to intercede, even for the poor privilege of being heard before condemnation. Affairs seemed, however, for a short time, to change their aspect. Wolsey, to the discomfiture of those who had stakes depending on a contrary result, was bidden to the royal presence; and was admitted with Campeggio to the chamber where the lords of council were in waiting for the king. Henry, on his entrance, either acted with a degree of feeling unusual to him, or he was softened by the presence of the man whose talents had long lent a charm to his social hours, and whose counsels had exalted the glory of England in foreign lands. He received Wolsey courteously, and even kindly; raised him from his kneeling posture, and leading him by the hand to the recess of a window, conversed with him long and earnestly. The explanation which then took place was favourable, as far as the attentive Cavendish could gather the discourse, to the restoration of Wolsey's favour; yet this temporary sunshine was soon obscured by the fascinations of Anne Boleyn, with whom the king dined that day. Whilst she, the idol of his passing affections, was undermining the fortunes of the Cardinal with her princely lover, the Duke of Norfolk, her uncle, could not suppress his exultations over the unhappy Wolsey, at dinner, and even threw out the alarming insinuation that it was the intention of the king to send Wolsey to his diocese of York, which he had never yet visited.

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* Cavendish, p. 225—229.

Thus assailed on all sides, Wolsey prepared to depart. His enemies had prevailed; and when he took leave, on the following day, in order to accompany Campeggio to London, the separation between him and the king was final. Wolsey had slept during the night at Euston, and on rejoining the court early in the morning, he found Henry accoutred for a sylvan excursion with Anne Boleyn, who had prepared a repast for the king in a neighbouring park, in order to prevent any subsequent interview between him and his former favourite.

In this hasty manner did these two men, long associated in the various pursuits of their several stations, bid each other a last farewell. Henry, in the company of his mistress, passed the day, it is to be presumed, with a careless gaiety, very different from the sad frame of mind in which Wolsey retraced his steps towards London. At the monastery of Saint Alban's, he parted from Campeggio, who, happier, though less distinguished than his colleague, journeyed in safety to his native land, after a slight disturbance of his progress, occasioned by the groundless suspicions of Henry, that Wolsey had transmitted, through Campeggio, the means of provision for himself in case of his escape to foreign lands. Wolsey had not, apparently, harboured any such intention. He returned to York House, and, on the commencement of the Michaelmas term, took his accustomed place, for one day, in the Court of Chancery, and exercised his high functions with his wonted parade. After this day he never sat there more. The ensuing morning he remained at home to receive the Dukes of Norfolk and Suffolk, the purport of whose visit was to demand from him the great seal. At the same time it was intimated that the king commanded him to leave York House, and to take up his abode at Esher, a residence appertaining to the bishopric of Winchester, and situated in the well known and beautiful vicinage of Hampton Court. Wolsey, with singular calmness, requested to know by what authority the two noblemen acted; they replied by that of the king. The Cardinal then protested against obedience to a verbal order, and refused to give up his office without the formality of letters-patent from the king, from whom he had received the seal. In vain the two dukes urged compliance with their orders; they were constrained to return to Windsor, and to bring with them, on the following day, the letters with the royal signature. These documents having been perused by Wolsey, with every appearance of respect and submission, he yielded to his fate, and resigned into the hands of the noble messengers the insignia of his high office. The dukes then left him, and Wolsey prepared to leave York House, and to take a last survey of the costly furniture with which his lavish hands had supplied the princely abode. How must the entire vanity of human grandeur have struck his mind when he looked around upon the decorations of his stately mansion,—the spacious gallery, occupied by various tables, on which were deposited large pieces of silk stuffs, of velvets, and of satins, the rich hoards of the Cardinal for future use;—the store of one thousand pieces of Holland cloth,—hangings along the walls of the gallery, cloths of gold and of silver, and precious tissues of various kinds:—sumptuous copes, intended for the clergy of his colleges at Oxford and at Ipswich, provided at his private expense;—in the adjoining chambers, long tables, laden with massive plate, both silver and gold, which was valuable and uncommon at a period when the use of pewter vessels, even in the households of the great, was scarcely abandoned! After a minute inspection of his property, Wolsey caused it to be carefully arranged, and the several articles to be entered in an inventory, which is still preserved among the Harleian collection of manuscripts in the British Museum. By this enumeration of his goods, and by collecting even those which were broken or spoiled, Wolsey probably hoped to conciliate his rapacious master, in evincing his submissive devotion to his will. He next allotted to each officer of the household his respective charge, and leaving strict injunctions that each portion of the spoils should be delivered to those who were empowered to receive it on the part of the king, he departed from York House. His last action in this scene of his former greatness, evinced how unsubdued was his proud spirit, by that reverse of fortune which afterwards bowed it to the dust. When he intrusted to Sir William Gascoigne, his treasurer, the superintendence of the forfeited property, the knight ventured to condole with him on the prospect of his being sent to the Tower, a fate which public report had already assigned to the Cardinal. For this surmise, Gascoigne received from Wolsey a sharp rebuke. "Is this," said he, "the good comfort and counsel that ye give your master in adversity? It has always been your natural inclination to be very light of credit, and much lighter in reporting false news. Go your way, and give good attendance unto your charge, that nothing be embezzled."

The Cardinal, attended by a selected number of his servants, now set out on his way to Esher, and entering his barge, at his private stairs, was rowed to Putney, where his mule, and the horses of his attendants, awaited him. Scarcely had he begun his journey, when his heart was gladdened by the approach of Sir Henry Norris, who hailed him with the glad tidings that "the king commanded his grace to be of good cheer;" and assured him that he "was in as much favour as he had ever been." With these encouraging words, Sir Henry delivered to Wolsey a ring, which had long served as a token between him and the king upon particular occasions. The surprise and delight with which Wolsey received these indications of mercy were promptly expressed in his gestures. Alighting from his mule, he prostrated himself on the earth, holding up his hands to heaven in joy and gratitude. The courteous Norris was lost for some minutes in thought and wonder, at the abasement of one whom he had seen the idol of courts and of princes. Placing himself also on his knees, by the side of Wolsey, he besought him to give credence to his message. Wolsey, overwhelmed with his emotions, could reply only by reiterated expressions of thankfulness to

God and the king; but it is to be feared that feelings of earthly ambition had the predominating influence over his mind. On parting, he gave to Norris, as a token of his friendship, a piece of the holy cross, commonly worn by the Cardinal around his neck. To the king he sent many messages of devotion; and recollecting, after taking leave of Norris, that Henry prized a favourite fool whom he had in his service, he recalled the knight, and bade the menial accompany him to the king; but the poor fool, preferring the service of his old master, could with difficulty be forced from the retinue; and the Cardinal had some thoughts of sending six of his stoutest yeomen to enforce the obedience of the attached and perhaps humoured individual.

Wolsey now proceeded to Esher, where he remained for some weeks in a state of anxiety and of privation which afforded a melancholy contrast to his former splendour. An information had been exhibited against him, in the king's bench, by Hales, the attorney-general, purporting, that, notwithstanding the statute of Richard the Second against procuring bulls from Rome, he had procured bulls for his legatine power, which he had for some years executed. This charge had even been preferred at the commencement of Michaelmas term, before the last appearance of the Cardinal in chancery. Wolsey, through his attorneys, confessed its justice, as far as regarded the procuring of bulls, but denied that the procedure was contrary to the statute, or prejudicial to the honour and interests of the king: he was, however, declared by the court to be out of the protection of the king; his lands and goods to be forfeited to the crown, and his person to be liable to seizure. The people,[†] although generally unfavourable to Wolsey, regarded this sentence as harsh and unjust. The Cardinal had exercised his legatine jurisdiction with the countenance of the king, and had never been questioned as to its legality. His services to the crown were not wholly obliterated from the public recollection, and he, who had been the object of envy, now became that of compassion. Deprived of all his personal property, the state of penury to which he was reduced seemed scandalous to the high station which he still occupied as Cardinal, and as the nominal Archbishop of York. His household, as Cavendish, who was still a member of it, relates, was destitute of beds, linen, cups, dishes, and plate, which they were obliged to borrow from Sir Thomas Arundell and the Bishop of Carlisle. This sudden reduction of the Cardinal's fortunes was not solely the effect of caprice and violence on the part of Henry, who inherited much of the grasping disposition of his father, and was determined to obtain possession of York House, the inspection of which had probably sharpened his appetite for the plunder of the Cardinal's effects. After a private negotiation with Wolsey, this point was conceded, and the splendid palace, which would have reverted to the church as an appendage to the see of York, was secured, by this piece of management, to the king, on the condition, that it should, on his death, be returned to the successor of Wolsey in the archbishopric. The effects of the Cardinal's submission were soon apparent. On the twenty-first of November he received the king's pardon, and was reinstated in the sees of York and Winchester. At the same time a number of his horses and mules were restored to him, and three thousand pounds in money.[*] These, with other articles, amounted altogether to six thousand, three hundred, and seventy-four pounds, which was all the wreck of his immense property that Wolsey ever received, after it had fallen into the hands of his rapacious master.

The indications of a relenting spirit on the part of the king towards Wolsey, were viewed with some alarm by the enemies of the Cardinal, who feared him more in adversity than in prosperity; for they knew how keen would be his vengeance, if he ever were reinstated in his former greatness. By their representations, the offences of Wolsey were magnified in the eyes of Henry, until the mind of that monarch was worked up to a determination to complete the ruin of his former favourite. By a council of nobles, assembled in the Star Chamber, it was resolved to refer the case of Wolsey to parliament; a bill was accordingly prepared, attainting Wolsey of high treason, and it passed through the house of lords. The articles contained in this bill were forty-four in number, and related chiefly to the abuses of the Cardinal's legatine authority. In some clauses of the bill he is charged with an usurpation of the royal jurisdiction, and with presumption in assuming the royal style in his dispatches to foreign courts. He is attacked, also, on the score of fraudulent and unjust transactions with the clergy; with the illegal suppression of monastic houses containing more persons than were specified in the bulls which he had received from Rome; and with the sin of having slandered many virtuous members of the conventual establishments. The diminution of hospitality and charity were also imputed as crimes to Wolsey, as well as other improprieties connected with the dissolution of monasteries. With regard to these charges, it must be recollected, that the measures adopted by the Cardinal were in most instances known and sanctioned by the king. The fraud and extortion of which he was accused cannot be considered as proved, because he was never allowed to answer the charges brought against him. The acts of oppression which he was said to have authorized in his transactions with the monastic orders, were trifling, compared with those afterwards committed by Cromwell and his agents in the work of suppression, and which were even encouraged by the king, whose avarice evidently increased with his years. This fact throws an air of injustice over the attainder, and confirms the opinion of Lord Herbert, that no man, who fell from a high station, had fewer crimes attributed to him on reasonable grounds. There is something almost ridiculous in the passages of this famous bill, which tax Wolsey with "consuming too much time with a fair tale in the council;" with "allowing no opposition," but "overwhelming it with his accustomable words, so that the members were better hold their peace than speak," for "he would have all the words to himself." Several other articles must have appeared equally puerile to those who were not burning with envy, or trembling with fear of the once pompous ruler of the council. Nor can posterity assent to the justice of the imputation which affixes to Wolsey the character of an "impeacher and disturber of due and direct correction of heresies," from his having prohibited the exertions of two bishops in their projected interference with a party of Lutheran students in Cambridge. The subsequent conduct of Henry vindicates the Cardinal also from the charge of having "greatly overshadowed, for a long season, the king's honour, and of having subverted the due course and order of the laws, to the undoing of a great number of the people."* When the administration of Wolsey ceased, the glory of Henry expired. All that was elevated in the character of this monarch seemed to have been banished with the minister. The spirit of improvement languished at home; the estimation of the English nation at foreign courts declined. The passions of the king actuated his counsels, and caused the oppression and slaughter of his people. The persecutions of his later years had received no sanction from the previous example of Wolsey. The burning of heretics, although frequent at this time in the diocese of Canterbury, had never been recorded within the ample limits of Wolsey's ecclesiastical jurisdiction. The immoral tendency of his example may be questioned, as far as it affected the king. During the ministry of Wolsey, Henry, for nearly eighteen years, remained contented with one wife, if not constant to her during the whole of that period; and the violent indulgence of his passions during his later years attests that some restraining hand must have curbed them in the more dangerous season of youth. The change which was so evident after Wolsey's fall, both in the character and administration of Henry, sufficiently exculpate the Cardinal from having diminished the reputation of his sovereign.

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[*] Cavendish, p. 257. [†] Herbert, p. 292.

[*] Rymer's Fœdera, vol. xiv., p. 375. The horses and their furniture were valued at one pound seventeen shillings each.

Sentiments of this nature may perhaps have actuated the members of the parliament, upon the introduction of the bill of attainder into that assembly. Before any decisive step was taken, the cause of Wolsey was effectually espoused by Thomas Cromwell, an individual hitherto of humble fortunes, who resided under his roof in the capacity of secretary. This office, which had been held by the celebrated Sir Thomas More, the successor of Wolsey as chancellor, and by Gardiner, his successor in the see of Winchester, was in all three instances the stepping-stone to preferments apparently little expected by any one of these eminent men. More seems not to have cherished very favourable sentiments towards Wolsey. Gardiner was too sedulously bent upon his own elevation, to extend any assistance towards a sinking benefactor; Cromwell, alone, though possessed of as much ambition as either of his former associates, evinced a degree of constancy towards his benefactor deserving of peculiar commendation, when it is recollected how arbitrary a monarch he had to serve. On being informed of the danger which threatened his patron, he hastened to London, and taking the seat of a friend, in the house of commons, defended Wolsey with so much energy and discretion, that the bill of attainder was flung out. It is in favour of Wolsey's innocence, that the answers with which Cavendish influenced this assembly, were dictated by the Cardinal, who, from hour to hour, gave most precisely his instructions. Yet this suspension of misfortune was productive of little immediate consolation to Wolsey, whose situation, during his continuance at Esher, presents a scene of mortifying deprivation and distress. Already had he been reduced to one of the most humiliating extremities that could befal a man of his character, that of being indebted to his domestics. Their fidelity was manifested by their refusal to quit him, even when he had confessed his inability to repay their services with the usual stipends. In this emergency Cromwell suggested an expedient, of which he set the first example. He recommended that the chaplains of the Cardinal, whom he had provided with livings, should each contribute some portion of their funds to the discharge of the wages due to the inferior servants. This plan succeeded; each of the chaplains throwing into the common fund as much as his means allowed, and Cromwell giving the first five pounds. After an affecting address to his household, whom he could not behold without tears, Wolsey distributed a portion of their wages amongst them, and they repaired to the hall, when some determined to go home to their friends, others to remain until the fortunes of their master should be improved. But there seemed little prospect that the hopes of these faithful followers would be gratified. The spirits of Wolsey were alternately raised or depressed by cheering or humiliating messages from the court, and by acts of unexpected kindness or of wanton insult. His lively sense of the cruelty exercised against him was plainly shown in the letters which he addressed, about this time, to Cromwell and to Gardiner, whose good offices he humbly solicited. At length his health gave way under the pressure of mental anguish, and the king was informed of his declining state. By the royal command, Doctor Butts, a court physician, was sent to attend the Cardinal; and he declared his conviction that Wolsey would fall a victim to his disorder, if his distress of mind were not alleviated. Influenced by this opinion, the king and Anne Boleyn now endeavoured, by acts of kindness, to soothe the irritations of the man whom Henry had not wholly ceased to value. These flattering, but transitory, gleams of favour soon revived the drooping frame of Wolsey, and his recovery was accelerated by the renewed comforts of his habitation, some of his furniture and other property being added to that which had been already restored. Change of scene was also permitted; and, through the intercession of Cromwell, he was allowed to remove to the lodge in the king's park, at Richmond, where he remained for some time in great comfort, although with a small number of servants, suited to the size of the dwelling. This pleasant abode Wolsey quitted for one still more calm, and even better calculated to quiet the tumultuous passions which had long held sway in his breast. In the beginning of Lent he entered the monastery of Carthusian friars, and occupied a lodging which the pious founder of Saint Paul's school, Dean Colet, had formerly prepared for his own retreat from a world, even to the virtuous, unsatisfactory. From the apartment in which Wolsey abode, a gallery led into the church, where he repaired every afternoon to service; and often would he sit in his cell, seriously conversing with one or other of the brotherhood, who dissuaded him from fixing his affection on the vain glory of his former state, and recommended to him acts of penance and habits of contemplation, fitted to aid the awful preparation for another world, whither he was shortly summoned.

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* Herbert, p. 292.

It had been for some time determined that Wolsey should remove to his archbishopric, a plan to which he no longer felt any repugnance, for he was now hopeless of effecting any change in the disposition of the king towards him. All prospect of personal intercourse with Henry was at an end; for it was universally understood, that he had promised Anne Boleyn never to see him more.[*]

Through the exertions of Cromwell, a thousand marks were with difficulty granted by the council, in advance, out of the revenues of Winchester, to defray the charge of his journey. The necessary arrangements being completed, he set out for York, in those days a formidable expedition; and it is observable, that he proceeded no farther on the first day than Hendon, in Middlesex, scarcely eight miles from London; and here he rested for a night in the monastery of Saint John. The rest of his journey was made with still greater deliberation; the Cardinal resting at different abbeys, to perform the numerous ceremonies appointed for the remarkable days so frequently occurring in the calendar of the Roman Catholic church. The archiepiscopal palace was at this time under repair, and Wolsey was obliged to accept the loan of a prebend's house at Southwell, about four miles from Newark, where he remained until Whitsuntide. He now conducted himself in a manner becoming a high dignitary of the church, and worthy of a Christian. His demeanour was affable without familiarity, decorous but not rigid, and liberal without profusion. To the gentry of the country, who resorted in great number to his abode, he showed a dignified and courteous hospitality. To the poor, and to all the lower classes, he evinced a charitable concern for their interests, which was long remembered by them with gratitude. "He gave to bishops," says a contemporary writer, "a right good example how they might win men's hearts."[†] He enforced the custom, then by no means general, of preaching sermons to the people; and frequently rode on holy days from church to church, enjoining the inferior clergy to perform this duty. He said mass among the people, and afterwards exhibited the fulfilment of a vital principle of religion, by causing the priests to compose any differences which might happen to exist among their flocks. He even accomplished the difficult task of soothing feminine resentments; and reconciled several married persons who had long lived in disunion. He restored dilapidated churches which had been applied to temporal purposes, and re-established the service of God in them. In these meritorious occupations Wolsey passed the period of his exile from the court; and doubtless, in the fulfilment of his duties, experienced a degree of calm enjoyment, to which he had hitherto been a stranger. While he joined with moderation in the social pleasures of the neighbourhood, he avoided, both from policy and a sense of propriety, such diversions as were likely to excite public animadversion, or to renew the displeasure of the king. Hence he resolutely withstood the temptations thrown in his path by the surrounding gentry to partake in the amusement of stag-hunting, to which he was extremely partial; and when he could escape it in no other manner, he avoided the allurement by a stratagem.[*] He now thought it expedient to leave Southwell, and to remain until Michaelmas at Scroby, another episcopal residence, whence he removed to Cawood castle, situated within seven miles of York. Both at Southwell and Scroby he left a reputation for wisdom, charity and piety, which won over to him his enemies in those districts, and caused him to be renowned as a benefactor.[†] At Cawood he began to make preparations for his installation into the archbishopric of York; a measure which unhappily accelerated his ruin, although it could not, with propriety, be deferred, consistently with the practice and ceremonials of the church. On this occasion, Wolsey displayed a prudent determination to avoid unnecessary parade and expense; and had not his scanty means been augmented by liberal donations from the neighbouring clergy and gentlemen, of oxen, sheep, wild-fowl, and other viands, but a poor provision would have been made for the installation feast. He was not, however, permitted to enjoy the manifestations of the respect which he had inspired in his diocese; and the very day that their well-meant offerings were deposited in his premises, he was destined to encounter the crisis of his misfortunes.

His ruin had long been decided, and his enemies only paused to consider in what mode, and at what moment, it could be most effectually completed. The popularity of the Cardinal in his northern diocese, and his intended installation, increased the dread with which his adversaries in the council still regarded him; and they plainly perceived that all affection for Wolsey had not been wholly extinguished in the bosom of Henry. It would be difficult to conceive in what manner the king could have been persuaded to a conduct so inconsistent as that which he now adopted. Already had the Cardinal been acquitted in parliament of the treasonable charges brought against him, and the king had since manifested his sense of the propriety of that decision, by acts of renewed kindness to the fallen minister, and by messages expressive of his favour; yet the capricious monarch now consented that the unfortunate Wolsey should be arrested for treason, and brought to London to stand his trial. By Wolsey this fresh calamity appears to have been wholly unexpected; and although the suspicions of his attendants had been in some degree roused by the hasty visit of two gentlemen from the king, and their superstitious fears excited by the accidental circumstance of the Cardinal's cross falling upon the head of one of his chaplains, yet no misgivings are stated to have disturbed the serenity of mind which he himself enjoyed before his final impeachment.

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[*] Le Grand.

[†] Cavendish, p. 318. See note, from a book printed in 1536, and entitled, a Remedy for Sedition.

[*] Cavendish, p. 322.

[†] Ib. p. 327.

It was about noon, just after the Cardinal had dined, and before his household had finished their repast, that the hall of Cawood Castle was suddenly filled with gentlemen and retainers, conducted by Henry Earl of Northumberland, and Sir Walter Walsh, one of the gentlemen of the king's privy chamber. The earl, on his entrance, commanded the porter, in the king's name, to deliver to him the keys of the castle; an order which was stoutly resisted by the trusty servant, who refused to resign what he had sworn to keep faithfully; and Lord Percy was obliged to leave them in his charge, with the security of an oath, that no person should be allowed ingress or egress without permission from the commissioners. Notwithstanding the confusion which this contest occasioned, Wolsey remained in ignorance of the tumult, until informed of it by a domestic, who chanced to see the proceeding from a small window, which, according to the fashion of ancient times, was placed so as to command a view of the hall. On receiving the intelligence which was thus communicated, Wolsey either affected to consider the arrival of the earl and knight as a visit, or really regretted, with the hospitality habitual to him, that he could not offer him a reception suitable to his rank. He ordered the table, at which he was seated, not to be removed, but to be replenished with such provisions as the castle afforded; and then advancing to meet the strangers, he encountered on the stairs the Earl of Northumberland, his former inmate, and pupil. Courteously chiding his guest that he had not apprised him of coming, Wolsey conducted Percy to his own apartment, that he might change his riding apparel; and there, Cavendish, the narrator of this interesting scene, alone accompanied them. The earl, confounded, perhaps, by the gracious manner and self-possession of the Cardinal, appeared unwilling to disclose the object of his commission to one whom he had been accustomed, from early habit, to fear, if not to reverence. At last, while standing with Wolsey by the chimney, he gained courage to say, in a faint and trembling voice, "My lord, I arrest you of high treason." It was some moments before Wolsey, astounded in his turn, could reply; but, recovering from his surprise, he demanded by what authority the earl acted; and refused to comply with his summons until he had seen his commission. Meanwhile, Sir William Walsh experienced a resistance equally resolute from Dr. Augustine, the Cardinal's domestic physician. He was thrust into the apartment at this critical moment by the enraged knight, who also made his appearance before Wolsey and the earl. On seeing Walsh, Wolsey made the same demand of his authority that he had urged to the earl; but Walsh, refusing to show his commission, to which he said some private instructions were annexed, Wolsey had not the satisfaction he demanded. He still declared, however, his objections to surrender to Percy, between whose ancestors, as wardens of the marches, and former archbishops of York, there had been, as the Cardinal alleged, old grievances, which might now actuate the representative of the house of Percy, to assert unwarrantable authority on this occasion. It is probable, that the humiliation of becoming the prisoner of one whom he had formerly governed, may have been the real source of this reluctance. After this concession, Cavendish was commanded to leave the chamber; and the unhappy Wolsey, after consigning the keys of all his coffers to the commissioners, remained in his solitary apartment, closely guarded by the followers of Northumberland. The following day was passed in various arrangements of the household furniture, and of the personal property possessed by Wolsey. Cavendish alone was admitted to converse with him; and the narrative which he gives of their interview is extremely minute and affecting. The Cardinal, on seeing him, fell into a passion of tears, "which would have caused the flintiest heart to have relented and burst for sorrow." The sight of Cavendish, who had left his family and his home to serve him in his adverse fortunes, and the recollection of his other faithful attendants, was rendered grievous to the generous heart of Wolsey, by the reflection that they shared his ruin. The contrast between their attachment, and the malignant persecution of his high-born accusers; the dread of humiliation and of severity, aggravated by the change, from the deference of those around him, sunk the spirits of the Cardinal to the lowest state of depression. Yet, even at this time, he expressed confidence in the manifestation of his own innocence. "If I may come to my answer," said he, "I fear no man alive; for he liveth not that shall look upon this face, and shall be able to accuse me of any untruth; and that knoweth my enemies full well, which will be an occasion that I shall not have indifferent justice, but they will rather seek some sinister ways to destroy me." Notwithstanding this protestation, the anguish of Wolsey's heart could not be repressed, and despair began its ravages both on his mind and body, before he quitted his archiepiscopal palace. On the Sunday following his arrest, which happened on Friday, the Cardinal began his journey towards London, having been preceded by Dr. Augustine, who, with harshness and apparent injustice, was dispatched to the metropolis, fastened to the body of a horse, and under a strict guard.

Although prevented by Percy from taking leave of his domestics, Wolsey was followed by expressions of sorrow and attachment from many of his household, who forced their way into the apartment where he was, and fell on their knees before him. Throughout the town of Cawood, he was hailed with cries of commiseration, and of vengeance upon his enemies; and similar testimonies of the regard borne to him by the people were manifested during the whole of his progress to Doncaster. But neither these demonstrations of well-earned respect, nor the soothing and courteous reception of the Earl of Shrewsbury, could allay that fever of the mind which plainly showed itself in the countenance of Wolsey on his arrival at Sheffield Park, where he rested for eighteen days. To the watchful eyes of Cavendish, the illness which now attacked the Cardinal was obvious before he uttered any complaint; and it soon appeared so alarming, that it was judged expedient, even by Lord Percy, to use a greater degree of tenderness and caution than had hitherto been deemed necessary towards his afflicted prisoner. It was now requisite to apprise him that Sir William Kingston, constable of the Tower, was on his road to Sheffield Park, charged by the king to conduct Wolsey to London, there to make that defence which he so earnestly had desired to deliver in the face of his accusers. On hearing the name of Kingston, Wolsey was overcome with grief and consternation; for his mind, weakened by disease and calamity, reverted to a prophecy that he should end his days near Kingston; on which account, he had always avoided passing through the town of that name, situated near his former residence at Esher.

Surmounting the emotions to which this recollection gave rise, Wolsey was persuaded to receive Kingston, whom he saluted with his wonted courtesy, and from whom he heard the encouraging tidings of the king's favourable dispositions towards him, and kind messages of grace. It was then arranged that Wolsey should proceed with Kingston on the morrow, towards Leicester, the last resting-place of the unhappy Cardinal; but his illness increased so rapidly that he was unable to commence his journey so soon as he had intended. Even when he was considered well enough to depart, his illness was such that he could scarcely support himself upon his mule; yet he remained only one night at Hardwick-upon-Line, and another at Nottingham, and proceeded, notwithstanding increasing weakness, to Leicester, where he arrived at night. On reaching the abbey, his appointed abode, he was met at the gates by the abbot and monks with torches, and received with great reverence. The first ejaculation of Wolsey, on greeting these holy persons, indicated his inward sense of his approaching death. "Father abbot," said he, "I am come hither to lay my bones among you;" and with much difficulty he was carried up stairs, and laid upon his death-bed, for he was now unable to walk, and his disease increased rapidly. Cavendish remitted not his last and sad attentions to his unfortunate master. After watching many hours by his bedside, the compassionate friend and attendant of Wolsey perceived that the object of his cares was likely soon to be released from his earthly troubles: yet the expiring light lingered in its socket, and the Cardinal continued to breathe until the following morning, when he seemed revived, asked for food, and confessed to one Dr. Palmes, who had for some time sedulously attended him. When this was finished, the morning was far advanced, and having, with the singular and unaccountable spirit of conjecture which is sometimes displayed by the dying, foretold the hour when his spirit should depart from its mortal tenement, he believed his end to be fast approaching. His words to Kingston, who bade him good morrow, were memorable and affecting. "I tarry," said he, "but the will and pleasure of God to render unto him my simple soul into his divine hands." He explained with great clearness the nature of his disease, which, in spite of some suspicions of his having taken poison, is credibly asserted to have been a dysentery, and alluding to the fatal tendency of that disorder; "Well, well, Master Kingston," said he, "I see the matter against me how it is framed; but if I had served God as diligently as I have done the king, he would not have given me over in my grey hairs." This remarkable and heartfelt reference to an existence spent upon the slippery ground of courts, in the pursuit of fallacious and unprofitable honours, affords an indication that, in his latter days at least, he had not suffered his understanding to be wholly perverted by the habits and associations of his life. After this acknowledgment, the second nature resumed the sway, and the dying Cardinal, again a courtier, besought Kingston to commend him to the king, and pressed him to remember all the communications which ever passed between them, especially touching the divorce. He manifested considerable anxiety with respect to the progress of the Lutherans, whose rapid increase in importance and estimation he dreaded as a zealous churchman. After a long address, which, as it has been transmitted to us, shows that the native energy of his mind remained with him to the last sigh, the unequivocal and awful symptoms of death appeared on his countenance. "And even with these words," says Cavendish, who received his parting breath, "he began to draw his speech at length, and his tongue to fail; his eyes being set in his head, whose sight failed him." Then the bystanders began to remind him of Christ's passion; the abbot was summoned to administer the fifth sacrament of the Roman Catholic church, called extreme unction; and the guard were also desired to witness his last moments. The superstitious notions of the age caused the spectators of the scene to regard as a circumstance of some moment, the coincidence of Wolsey's words with the hour of his death; he expired as the clock struck eight.

The character of Wolsey, obscured by the envy of his contemporaries, and by the resentment of the three sovereigns who succeeded Henry the Eighth, has received its due tribute of commendation in later times. He was a man enlightened far beyond the period in which he lived, and calculated to advance the progress of civilization with a rapidity inconceivable to inferior minds. The strength of his understanding was only equalled by the versatility of his talents. In each of the various spheres of action allotted to him, he effected some important and beneficial change; displaying, in his course, an originality in his conceptions, which overpowered the obstacles opposed by custom and prejudice. In his legislative and political functions, he generally laboured with assiduity to promote the order and prosperity of the realm; so that, had he never suffered his private interests to interfere with his public duties, and from his clerical habits suffered his discharge of those duties to be biassed by the spirit of his order, he would have been justly deemed one of the greatest statesmen his country ever produced. As a diplomatist, it were difficult to say whether his abilities or his industry were most remarkable. The object of his political measures was to preserve that balance of power, the notion of which he probably first infused into the mind of Henry; but in those times, general principles were much more frequently sacrificed to the passions and interests of kings and ministers, than in the present day, when a system of action is adopted in our councils, and if often erroneous, has at least the advantage of being discussed, and the chance of being dispassionately pursued. In Wolsey's foreign transactions he displayed a degree of decision, accompanied with caution, which may probably have been acquired from his insight into the cabinet of Henry the Seventh; and to this he added a more extended knowledge of political economy than any preceding minister.* The league of 1518, concluded at Greenwich, under the administration of Wolsey, has been regarded as a model for all treaties for peace; and the dexterity, not unaccompanied by artifice, with which Wolsey managed the conference at Bruges, shows how great an adept he was in all the minor branches of the diplomatic art. Eclipsed as his fine qualities often were by a selfish ambition not rarely dashed with sordid propensities, they conferred on the commonweal benefits of no trivial value. To Wolsey England is indebted for the first notion of a vigorous police, and of a regular system in the administration of justice. To him she owes, in part, the superiority of her navy, to which Henry the Eighth, by his advice, directed a closer attention, treating it with a greater liberality than any of his predecessors had done. To Wolsey may be ascribed the first regular patronage of the medical art. In a more general sense, incalculable benefits may be traced to the example and encouragement given by his zeal and energy in promoting a spirit of improvement, and in rousing men from the slumber of ignorance and dull contentment in which all classes of society were at that time in some degree plunged.

In the ecclesiastical department, the merits of Wolsey are less unequivocal. It is true that he sought to promote the truest interests of the church in facilitating the means of education to its members, and enabling them to attain that sound knowledge without which power is both pernicious and unstable. But while he cherished this meritorious scheme, the immediate effects of his example were detrimental to his sacred profession, and to religion. Although his zeal did not run into acts of persecution, yet it was generally suspected to result from ambition, and to savour far more of desire for the papal chair than of affection for the tenets of the church. In morals he was more than loose, not merely tolerating the improprieties of others, but countenancing them by his own departure from decorum. Yet some allowances are to be made for the profligate manners of the times, and for the lax notions of the great body of the clergy in those days of professed celibacy. In promoting the diffusion of science and letters, Wolsey aided the cause of virtue, ever most secure when attended by those auxiliaries, and invigorated by their natural consequence, mental employment. Wolsey was sincere and enthusiastic in his love for learning, both biblical and classical. Indifferently educated, and cast too soon into the business of life to make any great proficiency in literature himself, he is yet declared to have recalled into this country the "three learned languages, without which all learning is lame." He invited Erasmus, and other celebrated scholars to England, and selected his daily associates and his household from the same valuable class of persons.* Even before he had brought his designs regarding Oxford to maturity, he projected the establishment of seven additional lectures there, both for the promulgation of knowledge, and as a means of provision for the learned. His solicitude for the welfare of his infant college was manifested by affecting supplications to Henry for its continuance, after all his own worldly prospects seemed closed for ever.

In the personal character of Wolsey there is a mixture of magnanimity and meanness, of arrogance and of urbanity, which alternately excites contempt and admiration. For the display of qualities so opposite, his lowly origin and sudden elevation may, in some degree, account. His nature was generous and open, as the affection of his dependents testifies: but he became habitually haughty and overbearing from the assumption of a rank to which he had no claim by birth, and rapacious from the indulged desire to give to that rank the lustre of unwonted magnificence and parade. The greatest vice of his character was, that he knew not to forgive. An affront to his dignity, or a sarcasm upon his weaknesses, was keenly felt, and it was bitterly resented. The poet Shelton, tutor and poet laureate to Henry the Eighth, was pursued with unrelenting anger, for having indited satires upon the Cardinal, which were then deemed replete with poignancy; but in which the modern reader can with difficulty discover the sin of malice, through the veil of dulness. But Wolsey thought otherwise, or he regarded the design rather than the execution. The rash versifier died in the sanctuary of Westminster, whither he fled to escape the holy vengeance of this father of the church.

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* Herbert, p. 75.

* Strype's Ecclesiastical Memorials.

The more memorable fate of Buckingham was imputed to the wounded pride of Wolsey; and the early offence revenged upon Sir Amias Pawlet evinced, that if, in some instances, the motives of his conduct were misconstrued, the unchristian spirit attributed to it too surely sullied his character.

Wolsey left one illegitimate son, Thomas Winter, who received, through the bounty of his father, a learned education at Paris; and, by the patronage of the Cardinal, was presented to eleven benefices.* Two other children were also said to have owed their being to the Cardinal, who was charged, in the articles of his impeachment, with having compelled Sir John Hanley to resign a farm belonging to the convent of Chester, in favour of the man that had married their mother. This statement is less certain than the other; nor is the point of any importance, except as illustrating his imperious and unscrupulous nature.

The remains of Wolsey were interred in the Abbey church of Leicester, after having been viewed by the mayor and corporation of Leicester, for the prevention of false rumours. On removing the body, it was found that he wore a shirt of haircloth next to his skin, an act of penance customary among the pious in those days; and, though indicating very false conceptions of the will of that Being who has constituted our frames for enjoyment, and who has beautifully exemplified the image of happiness in the infant state of man, this little circumstance, which was unknown to the attendants of Wolsey, proved that repentance and self-abasement were in his thoughts.

It was deemed proper that the Cardinal's corpse should be interred decorated with such vestures and ornaments as appertained to his holy offices. Thus, attended to the last by some semblance of human grandeur, all that remained of Thomas Wolsey was deposited in the grave by torch-light, between four and five o'clock of the morning of St. Andrew's day, November 30th, 1530; the abbot and all the convent attending in solemn order, the canons singing dirges, and offering orisons.

The king, upon hearing of the death of his former favourite, is said to have expressed poignant concern, and to have declared that he would rather have lost twenty thousand pounds than so valuable a man; yet his grief did not prevent the selfish monarch from interrogating Cavendish, who conveyed to him the tidings, with some anxiety, about a sum of fifteen hundred pounds due to him from Wolsey; nor could his regard for the memory of a distinguished subject induce him to give it the just and even accustomed honours. The Cardinal's college, the glory of Wolsey, was assigned to a new patron, the monarch himself; and his monument, prepared by his own orders, and designed by Benedetto, a famous Florentine sculptor, was seized by Henry, who left the tomb of his renowned minister destitute and obscure.

It is impossible to close the page of history on which we have been meditating, without marking a circumstance calculated to give the personal character of the bold, able, and unprincipled man, whose story lies before us, a kind of interest that, strictly speaking, belongs not to it,—we mean the contrast presented by his royal master. When, revolted by the Cardinal's unbearable haughtiness, or disgusted with his meanness, we turn to the king and find him clothed in all his minister's worst vices, and glaring with all his own, unredeemed by a single virtuous or amiable quality, we at once acknowledge that a more hateful tyrant has scarcely ever cursed any country whose sins he was suffered to chasten, and feel disposed to dwell upon Wolsey's talents as a mitigation of his faults. This feeling is softened into something like pity, when we reflect on the black ingratitude that worked his ruin; we are fain to admit that his fall was effected by almost the only hand which had no right to rise against him; and we retire with the impression, that no one portion of his character claims more of our reprehension than his unhesitating, undeviating subserviency to his imperious master.

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* Fiddes, p. 531.

SIR EDWARD COKE.

It has often been observed, that the biography of those men who have enlightened or entertained the world by their writings, is barren of incident, and devoid of interest. But this, like all other general remarks, is subject to many exceptions. Besides the numerous instances of authors, whose lives have been chequered with variety of adventure, and frequent change of fortune, history, both ancient and modern, furnishes abundant examples of illustrious philosophers, and poets, and historians, who, while their leisure moments have been devoted to study, have nevertheless borne an active and a conspicuous part in the passing events of their time. As the life of every one who has taken a share in public affairs, must necessarily partake in a great degree of the interest attached to whatever is connected with them; and as it has almost invariably happened, that the most eminent individuals in every department of literature and science have flourished during periods the most pregnant with important or extraordinary circumstances, the biography of such of them as have stood forward on the stage of public life can seldom fail to be both interesting and instructive. The life of the great lawyer who is the subject of the following memoir, is an instance corroborative of this observation. The profession to which he devoted himself is one that, in this country, generally obliges those who attain very considerable eminence in it, to occupy a conspicuous station in the political community; and the exercise of their public duties is for the most part connected with those most important of all objects, the civil liberties, the rights and immunities of their countrymen. The period during which he lived, comprises the greater part of the reign of Elizabeth; the whole reign of James I; and part of that of Charles I; a space of time peculiarly memorable in the history of the English constitution, since during its continuance the prerogative of the crown was exerted and enforced with that intemperate want of forbearance, which afterwards caused its complete overthrow. These circumstances are sufficient to compensate for the want of personal incident and adventure.

Edward Coke was the descendant of an ancient and honourable family of Norfolk. He was born at Mileham, in that county; (1550;) and his father, who was himself a barrister of some eminence, dying while he was still young, he was at an early age left heir to a considerable fortune. Fortunately, however, his wealth did not eventually prevent him from embarking in the same honourable but laborious profession his parent had adopted. The bar was at that time considered, much more so than it is at present, a pursuit peculiarly adapted to the aristocracy; and whether there were more of ambition or of assiduity among their youth than they have been wont to display of late years, it certainly was then by no means uncommon to find men born to the enjoyment of ample fortunes devoting themselves to the study and the practice of the law, with no less zeal and perseverance than the keenest necessity could have stimulated them to exercise.

Coke was not poor, but he possessed a mind capable of the closest application, and ambition to render him assiduous in any pursuit that held out to him hopes of honour and preferment.

It is unnecessary to dwell on the particulars of Coke's education, as it does not appear that he was distinguished for any of the precocity of talent, or that his boyhood was attended with any of those uncommon circumstances, which sometimes give celebrity to the early years of remarkable men. After remaining a sufficient time at the free school of Norwich, where he had been sent at the age of ten years, he became a member of Trinity College, Cambridge, about the same time that the celebrated Doctor Whitgift was appointed master. There he resided during nearly four years; and having taken the degree of bachelor of arts, he afterwards proceeded to London for the purpose of studying the law as a profession. According to the general custom of that time, which required a student to go through a noviciate of some length in one of the inns of Chancery, previous to his admission as a member of either of the great inns of court, Coke was first enrolled among the students of Clifford's Inn, before his name was entered on the books of the Inner Temple.

Here he shortly distinguished himself by his assiduity and his rapid proficiency in study, which the frequent mootings and other academical exercises then practised in the inns of court gave him an opportunity of displaying to his seniors. Such public lectures and examinations, besides being capable of affording some assistance to those who were thrown without a guide among the intricacies of an abstruse study, had the advantage of bringing into notice many whose professional attainments might otherwise long have remained unknown. They have now for many years past been discontinued. Lord Keeper Guildford being represented by his entertaining biographer, Roger North, as the last person who regarded them in any other light than that of antiquated ceremonies; and, indeed, it appears, that even in Coke's time they were beginning to be much neglected; though this is a circumstance that he often laments in his writings.

It is much to be regretted that we have no detailed account of Coke's early studies in his profession; but we may gather from his occasional remarks on the subject, that he considered the time a young lawyer devoted to his profession might be best divided between attendance on the courts, or public lectures, and private reading. "I would advise our student," he says in one place, "that when he shall be enabled and armed to set upon the year bookes, or reports of law, that he be furnished with all the whole course of the law, that when he heareth a case vouched and applyed either in Westminster Hall, (where it is necessary for him to be a diligent hearer, and observer of cases of law,) or at readings or other exercises of learning, he may finde out and read the case so vouched; for that will both fasten it in his memory, and be to him as good as an exposition of that case. But that must not hinder his timely and orderly reading, which (all excuses set apart) he must bind himselfe unto; for there be two things to be avoyded by him, as enemies to learning, *præpostera lectio* and *præpropera praxis*." It is to be supposed that it was thus he himself acquired that fund of legal knowledge, for which he was remarkable even while he continued a student. In this capacity he remained during six years; after which time, in consideration of his great proficiency in the law, he was permitted to be called to the bar, though the usual period of probation was then eight years. The flattering compliment thus paid by the heads of his profession to his learning and talents was of itself a sufficient recommendation to ensure him early opportunities for bringing himself further into notice. Accordingly we find him engaged as counsel in a case of some importance so early as 1578, that is, in the twenty-eighth year of his age. He was also appointed reader or lecturer at Lyon's Inn, an office which he held during three years; and his readings, (which were not given, as it is usual to give them at present, merely for the sake of observing an antiquated form,) were so assiduously attended, and so generally admired, that he rapidly attained a degree of repute much greater than that of any other barrister of the same age and standing at the bar. His practice, in consequence, daily increased; and he was at length retained as counsel in almost every cause of importance that was tried in Westminster Hall. He became recorder of the cities of Norwich and Coventry, then solicitor to the queen, and afterwards attorney-general. His career was equally successful in parliament. He was returned by the freeholders of Norfolk as knight of the shire; and in 1592 was made speaker of the House of Commons.

The increase of his fortune, which, it has been already mentioned, was originally considerable, more than kept pace with his preferment. Soon after he had been called to the bar, he had contracted a marriage with a lady of the ancient and highly connected family of the Paston's; and he received with her a fortune, such as was considered at that time a very large one, no less a sum than thirty thousand pounds. After her death, which occurred while he was attorney-general, he formed another no less advantageous alliance (1598) with the daughter of the celebrated Lord Burleigh. This lady, who was the widow of Sir William Hatton, also brought him a considerable addition to his property, as well as to his consequence; but his marriage with her was not productive of domestic happiness. The celebration of the ceremony involved the parties in some difficulty. Notwithstanding the severity with which Archbishop Whitgift had shown himself disposed to treat all those who were privy to marriages performed in an irregular manner, this had been solemnized in a private house, without a licence being previously obtained for the purpose; and notwithstanding the footing of acquaintance, if not of intimacy, on which that prelate stood with regard to the attorney-general, the act of contumacy was not passed over. A prosecution was instituted in the ecclesiastical court against all the parties concerned, among whom was Lord Burleigh himself. The consequences might have been serious, had the authority of the church been exerted to the utmost on the occasion; but it is probable that the suit was commenced merely for the sake of public example, and the penalties incurred were eventually remitted. It is curious to remark that the cause assigned for this lenity was, that the offence had been committed through ignorance of the law.

Meantime the professional duties of the attorney-general were prosecuted with unremitted attention; and it is supposed, that in addition to the functions which belonged to his office, he had other occupations to employ his attention in private, being frequently consulted by the queen's council in matters only indirectly connected with his public duties. But, notwithstanding the multiplicity of his avocations, he found time in 1600 to publish the first of the eleven parts of his Reports, the remainder of which were completed during the subsequent reign.

In the same year occurred the memorable trial of the Earls of Essex and Southampton, for high-treason. They had been guilty not only of conspiring against the government, but of actually exciting the citizens to revolt and insurrection, with the intent (as the indictment set forth) of compassing the queen's death. The case for the prosecution was, of course, conducted on the part of the crown by the attorney-general; but he acquired little credit by his conduct on the occasion. It is true that, according to the general practice of that time, state prisoners were commonly treated with a degree of harshness and severity quite incompatible with the just and benevolent axiom of the English law, which supposes every accused party innocent until the charges brought against him have been confirmed by a verdict. The person to be put on his trial was thrown into prison without the formality of an indictment. When confined, he was allowed neither pen, ink, nor paper; his friends and relations were denied access to him; and till the time of his appearing in court he remained in utter ignorance of every charge that was to be brought forward against him. He was not allowed to have any previous knowledge of the persons who were to compose the jury, though his right of challenging was almost the only privilege he was permitted to exercise; and whatever number of witnesses the crown might think proper to produce against him, he was not suffered to question them, or reply to their statements, until the whole case for the prosecution was closed. In short, the law treated the accused in every respect as though his conviction had already taken place, and he was unworthy to be considered other than a culprit. The formal proceedings in court were carried on in the same spirit. State trials were habitually conducted with a want of liberality, and even of decorum, towards those who were arraigned, which would be quite intolerable to the spirit and good taste of the present age. The counsel appointed to act on behalf of the crown seldom thought it necessary to appear, as if, in pressing their accusations against its enemies, they were reluctantly performing a painful duty; and far from endeavouring to mitigate by the mildness of their deportment the actual severity they were called upon to exercise, it was not unusual with them to aggravate it by expressions of personal hostility towards the prisoners on trial. The common prevalence of this practice might, perhaps, in some measure excuse (though it certainly cannot justify) Sir Edward Coke for conforming to it. But he carried this fault even farther than his contemporaries. In the prosecution of the Lords Essex and Southampton, whether from the natural violence and irritability of his temper, or from a desire of showing his obsequiousness to the queen by his treatment of her enemies, he behaved towards the two accused noblemen with a malignity and want of forbearance that not only tarnished his own reputation, but rather injured than strengthened the case which had been put into his hands. It is well known that the insurrection, which formed the chief ground of accusation against them, was too public and too notorious not to be fully capable of being proved by the most unexceptionable testimony; yet Coke, not satisfied with the depositions of the witnesses, interrogated the accomplices of the treason, and even went so far as to examine the avowed enemy of the Earl of Essex, Sir Walter Raleigh, concerning what he had indirectly heard on the subject of the alleged conspiracy. Each of the peers, in his defence, alluded to the marked animosity which the attorney-general had displayed throughout the trial; and Lord Southampton, addressing him, said: "You urge the matter very far, and you wrong me therein; my blood be upon your head."

But violent and intemperate as was the bearing of Coke in prosecuting this charge, the manner in which he treated Sir Walter Raleigh on a similar occasion, reflects much greater disgrace on his character. The trial of that justly celebrated man took place in 1603, in the first year of the reign of James I. He was accused of high treason, in compassing and imagining to depose and destroy the king, and of treating with the Spanish government for assistance in the execution of his purpose. It is not necessary to enter into a detail either of the accusation or of the evidence that was adduced to support it. What foundation ever existed for the charge, it is now, as indeed it appeared at the time, to be impossible to ascertain; but at all events the testimony, by means of which Sir Walter was condemned, was entirely illegal. The only direct deposition that affected his innocence, was that of Lord Cobham, who was not openly produced in court as a witness, and who had made a solemn recantation of his former evidence. The law required that the accused party should not be convicted but on the testimony of two credible witnesses brought face to face; on this the prisoner insisted in his defence; but this clear and explicit rule of law was thought to give an inconvenient protection to the life and liberty of the subject, and was accordingly overruled through the influence of the attorney-general, who, however, could not, and did not attempt to show that the statutes, (5 and 6 Edward III. cap. 11,) by which it is expressly enacted that there shall be two witnesses in cases of high treason, had ever been repealed. He merely affirmed in general, that the law was altered; and endeavoured to account for the change, by declaring "that the crown could not stand a year upon the king his master's head, if a traitor could not be condemned by circumstances." By this corrupt and disgraceful artifice, Sir Edward Coke not only succeeded in procuring the condemnation of Raleigh, but furnished a precedent, by means of which at after periods many other persons accused of high treason were unjustly and unlawfully convicted. His deportment towards his illustrious victim during the trial, was not less derogatory to the dignity of his own office, than offensive to decorum, and even insulting to the court. He loaded this accomplished gentleman and scholar with abuse and scurrility; called him the most notorious traitor that ever came to the bar: a monster, a viper, a spider of hell, a damnable atheist, one who had an English face, but a Spanish heart; and carried the licence of speech, which the custom of that time in some degree authorized, to an extent that had never before been attempted. The calmness and self-possession of the accomplished individual to whom these epithets were applied, served to make the overbearing conduct of the attorney-general appear more odious by the contrast. The following specimen of a dialogue that took place between the accuser and the accused, places the difference in a sufficiently strong light. After calmly listening to a long strain of scurrility and invective, Sir Walter observed:

"You speak indiscreetly, barbarously, and uncivilly."

Coke. "I want words to express thy viperous treasons."

Raleigh. "I think you want words indeed; for you have spoken one thing half a dozen times."

Coke. "Thou art an odious fellow: thy name is hateful to all England for thy pride."

Raleigh. "It will go nigh to prove a measuring cast between you and me, Mr. Attorney."

The conduct of Sir Edward Coke throughout this trial must have been recollected by Bacon, when, at a later period, he observed to him: "As in your pleadings you were wont to insult over misery, and to inveigh bitterly at the persons, which bred you many enemies, whose poison yet swelleth, and the effects now appear; so you are still wont to be a little careless in this point, to praise or disgrace upon slight grounds, and that sometimes untruly, so that your reproofs or commendations are for the most part neglected and condemned; when the censure of a judge, coming slow but sure, should be a brand to the guilty, and a crown to the virtuous. You will jest at any man in public, without respect of the person's dignity or your own: this disgraceth your gravity, more than it can advance the opinion of your wit; and so do all actions which we see you do directly with a touch of vain-glory, having no respect to the true end."

From the tenour of these remarks, which were addressed to Coke under the form of "an expostulation," it will be perceived that he was not upon terms of friendship with the illustrious personage who afterwards became Lord Chancellor. Though the want of amity between them may, no doubt, in some measure be attributed to the insolent and haughty bearing of the attorney-general, it must be admitted, that a feeling of jealousy, wholly unworthy of such a character as Bacon's is usually represented, was probably the chief cause of it. But, to whichever of the two the original wrong be imputed, it is certain that their dislike of each other shortly became mutual, and was at length increased to undisguised animosity. After the specimen which has been just given of the language employed by Coke, in the trial of Sir Walter Raleigh, it will not excite much surprise to find him on another occasion forgetful of decorum (at least as decorum is at present understood) towards his own personal enemy; and to perceive that the same ungovernable warmth of temper which he had before exhibited in so disgraceful a manner, should again give a calm opponent a decided advantage over him. Bacon has left among his works a short tract, entitled, "A true remembrance of the abuse I received of Mr. Attorney-General, publicly in the exchequer, the first day of term; for the truth whereof I refer myself to all that were present:" and if this document state the circumstances correctly, it will not be disputed that the attorney-general would, in every point of view, have done wisely if he had refrained from provoking such an adversary to an open contest.

Bacon, who was then at the bar, had occasion to move for the reseizure of some lands, "and this," says he, "I did in as gentle and reasonable terms as might be."

"Mr. Attorney kindled at it, and said: 'Mr. Bacon, if you have any tooth against me, pluck it out; for it will do you more hurt than all the teeth in your head will do you good.' I answered coldly in these very words: 'Mr. Attorney, I respect you; I fear you not; and the less you speak of your own greatness, the more I will think of it.'

"He replied: 'I think scorn to stand upon terms of greatness towards you, who are less than little; less than the least;' and other such strange light terms he gave me, with that insulting which cannot be expressed.

"Herewith stirred, yet I said no more but this: 'Mr. Attorney, do not oppress me so far; for I have been your better, and may be again, when it please the queen.'

"With this he spake, neither I nor himself could tell what, as if he had been born attorney-general; and in the end bade me not meddle with the queen's business, but with mine own; and that I was unsworn, etc. I told him, sworn or unsworn was all one to an honest man; and that I ever set my service first and myself second; and wished to God that he would do the like."

It was probably in reference to this quarrel that Bacon addressed the following letter to the attorney-general:

"I thought best, once for all, to let you know in plainness what I find of you, and what you shall find of me. You take to yourself a liberty to disgrace and disable my law, my experience, my discretion. What it pleaseth you I pray think of me; I am one that know both mine own wants and other men's, and it may be, perchance, that mine mend, when others stand at a stay. And surely I may not endure, in public place, to be wronged without repelling the same to my best advantage, to right myself. You are great, and therefore have the more enviers, which would be glad to have you paid at another's cost. Since the time I missed the solicitor's place, the rather I think by your means, I cannot expect that you and I shall ever serve as attorney and solicitor together; but either to serve with another at your remove, or to step into some other course; so as I am more free than ever I was from any reason of unworthy conforming myself to you, more than general good manners, or your particular good usage shall provoke; and if you had not been short-sighted in your own fortune, as I think, you might have had more of me. But that time is passed. I write not this to show my friends what a brave letter I have written to Mr. Attorney; I have none of those humours. But that I have written is to a good end, that is, to the more decent carriage of my master's service, and to our particular better understanding one of another. This letter, if it shall be answered by you in deed, and not in word, I suppose it will not be worse for us both; else it is but a few lines lost, which for a much smaller matter I would have adventured."

It will be collected from these passages, that Bacon had been foiled in his endeavour to become solicitor-general; and that he attributed the disappointment of his expectations to the influence of the attorney-general. As this circumstance would, according to his own statement, have prevented him from holding the post of solicitor while Coke remained in his office, Bacon, who was always keenly alive to his own interest, suppressed his personal dislike of his enemy so far as to exert himself to procure his advancement. Previous to the trial of Sir Walter Raleigh, that is, almost immediately after the accession of James I., Coke had received the honour of knighthood; and it is to be supposed that the active exertions which he subsequently made (1605) in the prosecution of the persons connected with the gunpowder treason, had ingratiated him in the favour of that monarch. The zeal for the cause of the government, and the great professional knowledge which he displayed throughout the whole of the proceedings connected with the conspiracy, but particularly on the trial of the jesuit, Garnet, marked him as a fit subject for promotion. Accordingly in 1606, (having been previously admitted to the rank of serjeant at law,) he was appointed chief justice of the court of Common Pleas. The vacant place of attorney-general was at the same time filled by Sir Henry Hobart, and Bacon became solicitor.

Sir Edward Coke retained his situation of chief justice of the Common Pleas during upwards of seven years. It was a place for which his profound knowledge of the law eminently qualified him; and though he was, probably with justice, reproached for his haughty and unconciliating deportment on the bench, it appears that, upon the whole, the manner in which he acquitted himself of the duties of his office gained him the highest credit. Bacon, indeed, has accused him of making the law lean too much to his opinion, and using it as a double-edged weapon; but however his conduct in the prosecution of Sir Walter Raleigh may seem to justify such an imputation, there is certainly no proof of it on record, and the general charge, coming from such a quarter, cannot be entitled to implicit credit when unsupported by any corroborative testimony.

It does not appear that Sir Edward Coke ever expressed, or even entertained, a wish to be removed from the court of Common Pleas, unless indeed there might have been an opportunity of raising him to the Woolsack. But Bacon, who was high in favour at court, had his own reasons for wishing that his enemy should be preferred to the chief justiceship of the King's Bench, as by this change Sir Henry Hobart might be advanced to his vacant place in the Common Pleas, and the office of attorney-general would thereby be accessible to himself. In order to bring about these changes, he had recourse to an expedient such as, according to our present notions, must appear equally at variance with discretion and with delicacy. This was no other than drawing up a tract, of which the purport may be learned from the title: "Reasons why it should be exceeding much for his Majesty's service to remove the Lord Coke from the place he now holdeth, to be chief justice of England, and the attorney to succeed him, and the solicitor the attorney." It is remarkable that this document contains an indirect eulogium on Coke's behaviour as a judge, since it admits that he had more than once opposed the views of the king; a line of conduct for which it is impossible to suppose any other motive than fearless and uncompromising integrity in the discharge of his duties. Among the reasons urged for the propriety of appointing him to the King's Bench, it is said that: "The remove of my Lord Coke to a place of less profit, though it be with his will, yet will be thought abroad a kind of discipline to him for opposing himself in the king's causes; the example whereof will contain others in more awe." And in another place it is remarked, that the proposed changes "will strengthen the king's causes greatly amongst the judges; for both my Lord Coke will think himself near a privy counsellor's place, and thereupon turn obsequious; and the attorney-general, a new man, and a grave person, in a judge's place, will come in well to the other, and hold him hard to it, not without emulation between them, who shall please the king best." It is to be supposed that these reasons had their weight with James I, since we find Coke actually appointed chief justice of the King's Bench, (October 25th, 1613,) and the other suggestions of Bacon also complied with, by the promotion of Sir Henry Hobart and himself, Sir Henry Yelverton being preferred to the vacant solicitorship. Shortly afterwards, Sir Edward was sworn a member of the privy council.

However, this change of place had not the effect which Bacon affected to anticipate, of rendering the new chief justice of the King's Bench more pliant and obsequious. He never suffered his complaisance for the king to betray him into a step that was inconsistent with the duty or might detract from the dignity of his judicial office. On one particular occasion, a prosecution for treason being in contemplation against a minister named Peacham, who had written certain libellous passages in one of his sermons, the king wished to have the private opinions of all the judges on the case, before it was officially brought under their notice. Bacon was employed to sound them on the subject, and he encountered little or no opposition from any of them except the lord chief justice. It was Coke's favourite maxim, that he was a judge in a court and not in a chamber; and on this principle he refused to comply with the wish of his majesty; maintaining that such a mode of taking private opinions was contrary to the custom of the realm. The letters which Bacon wrote to the king on this occasion contain some curious information, as to the dexterity he employed to gain his master's ends; but it was without effect. He at length succeeded in persuading Coke to look over the papers connected with the prosecution, and afterwards, by dint of importunity, extorted from him an answer to the questions he had put; but it was so unsatisfactory, that he declared to the king he was glad for his own exculpation to be able to send it in the chief justice's own hand-writing. This and other spirited demonstrations of manly integrity are the more likely to attract our admiration, when contrasted with the many specimens of servility displayed by other distinguished characters during the same reign. The difference plainly shows, that Coke was rising superior to the willing obsequiousness which was the vice of his time; a vice that has left something of its stain on the history of his own early career, whatever the general independence of his conduct in his maturer years may have done towards obliterating it. It is to be recollected, that at this period he had perhaps stronger inducements than most of his contemporaries to court the favour of his sovereign. The continuance of his office was dependent solely on the king's will; and, as the chancellorship might be expected shortly to be vacant, there was on one hand a prospect of further preferment as a reward for obedience, on the other, the risk of disgrace as a punishment for refractory behaviour. To the honour of Coke, however, he disregarded every consideration but that of duty. One instance, indeed, is recorded of his having judicially promulgated an opinion in favour of those unjust and arbitrary expedients for raising supplies which went by the very inappropriate name of benevolences; and it is to be supposed that his conduct in this particular, whatever might be the real motive of it, was in effect excellently calculated to propitiate the good graces of James; but there are several other circumstances which go to prove that his general behaviour on the bench was any thing but that of a courtly sycophant. He never descended in this respect so low as Bacon, whose subserviency to the will of the king was indeed unbounded; and it is singular that the arts which this intriguing courtier was constantly and successfully employing to injure Coke in the king's estimation, were such as cannot but have a directly contrary effect with regard to the estimation of disinterested judges. This has been already exemplified by the arguments which he used to procure the removal of his enemy from the Common Pleas to the King's Bench; and a letter which he wrote to King James (in 1615) in order to dissuade him from appointing Sir Edward to succeed Lord Ellesmere on the woolsack, affords another instance of the same kind. In this letter, after enumerating several reasons, which do great credit to the person whose advancement they were intended to prevent, he concludes: "Lastly, popular men are no sure mounters for your majesty's saddle."

Two of the most remarkable instances of Sir Edward Coke's having acted a part that rendered him highly obnoxious to the king, are the dispute concerning the power of the Chancery and the celebrated case of the *commendams;* both memorable events in the history of the English jurisprudence. The particulars of both were briefly as follows.

The court of Chancery had long exercised a jurisdiction, which though now conceded to it, had been the subject of frequent complaint, and formed one of the articles against Wolsey, of revising and correcting judgments which had been obtained in the courts of common law. It was not till the reign of James that this privilege had been seriously called in question; the judges of the King's Bench, and particularly Sir Edward Coke, who were extremely tenacious of the authority of their court, then gave it as their opinion that the Chancery had no such right, and that an appeal from a judgment at law could not legally be made, except to parliament. Their doctrine was founded on the words of one of the statutes, which were framed during the reign of Edward III, for the purpose of preventing appeals to the courts of Rome. This statute, without distinctly specifying the papal courts, included them in a general enactment, which provided that whosoever should, after the delivery of a judgment in the king's courts, impeach its authority in any other court,(*en autrui court,*) should incur the penalties of a *præmunire.* According to this express declaration of the act of parliament, the jurisdiction exercised by the court of Chancery over matters which had been already adjudged in the courts of King's Bench and Common Pleas was held to be entirely illegal; and in pursuance of this doctrine Judge Croke, in his charge to the grand jurors of Middlesex, directed them to present any persons who might have called the judgments of those courts in question. Two recent cases, in which appeal had been made to the chancellor, were selected for an example; and it was determined that all the parties who had been privy to the proceedings, including solicitors, suitors, officers of the court, and even a master in Chancery, should be indicted on the statute of Edward III. However, as in consequence of some fraudulent means employed by the parties to the original suit at law, those two cases happened to have been very erroneously and unjustly decided by the King's Bench, they only served to exemplify the expediency of the interference of the court of Chancery; and the grand jurors resolutely persisted in refusing to bring in the bills required of them.

This unusual affair excited a very considerable degree of interest; and a sovereign so tenacious of his prerogative as James, was not likely to let it proceed further without his interference. As Lord Ellesmere was at the time unequal to the task of defending the cause of his court, being afflicted with an illness which was hourly expected to prove fatal, the whole proceedings were reviewed by commissioners whom his majesty appointed for the purpose. According to the memorial which was drawn up, or at least corrected, by Bacon, it appears that the investigation was conducted with great deliberation and impartiality. Care was first taken to examine whether the chancellor had been in fault; that is, whether his course of proceeding in the two cases which had formed the subject of dispute, had not been conformable to acknowledged authority and precedent. The report of the commissioners certified, "that the precedents of that kind were many and precise in the point, and constant, and in good times, and allowed many times by the judges themselves." The question was then put, "Whether, upon apparent matter of equity, which the judges of the law by their place and oath cannot meddle with or relieve, if a judgment be once passed at common law, the subject shall perish, or that the Chancery shall relieve him? and whether there be any statute of *præmunire*, or other, to restrain this power in the chancellor?" Upon mature consultation and advice the answer was, that "the Chancery was not restrained by any statute in that case." The clerks of the King's Bench were next desired to search for precedents of indictments against the Chancery; and on their declaring that they were able to find only two, and those merely of indictments offered or found, on which there had been no further proceeding, his majesty (in the words of the memorial) "thought then it was time to question the misdemeanor and contempt in scandalizing and dishonouring his justice in that high court of Chancery in so odious a manner." Proceedings were therefore instituted in the star-chamber against the offenders, and the conduct of the judges of the King's Bench was referred to the consideration of the council table.

It is generally admitted that the course pursued by Sir Edward Coke and his associates on this occasion was highly discreditable to them. The whole dispute, as Blackstone justly remarks, did not tend much to the advancement of justice; and it is certain that the violent measures adopted for the sake of asserting the independence of the King's Bench, were wholly inconsistent with the moderation and decorum which ought ever to characterise the measures sanctioned by courts of justice. However, the proceeding at least shows that Coke was not the servile minister of the king's will; and his conduct in the case of the *commendams*, for which he was arraigned at the council table at the same time as for the other offence, will be allowed to merit unqualified admiration.

The practice of giving livings in *commendam* was usually adopted by the crown for the sake of adding to the profits of poor bishoprics, or in some instances of poor benefices. It could only be resorted to in the case of livings to which the right of presentation had, either by lapse or otherwise, devolved upon the king; when the sovereign might *recommend* a clerk as a fit person to discharge the duties till such time as a new incumbent could be regularly appointed. Now it happened that on the occasion of a writ of *quare impedit** brought against the Bishop of Litchfield and Coventry, the defendant pleaded that he held the living in dispute in *commendam;* and, among other important points of law which were involved in the discussion of the case, the right of the sovereign to grant *commendams* was called in question. The king, who perhaps anticipated what would happen, had ordered secretary Winwood, and the Bishop of Winchester, Dr. Bilson, to attend in court during the trial, and make a report to him of the proceedings. The bishop alone, however, was present at the hearing of the cause, and he gave his majesty to understand that Serjeant Chiborne, who argued against the *commendams*, had maintained several positions prejudicial to the royal prerogative; among others, that the king had only power to grant *commendams* in case of necessity, which necessity could never, in fact, exist, since no clerk was bound to keep hospitality above his means. On the receipt of this information, the attorney-general, Bacon, was immediately directed to acquaint Sir Edward Coke that it was the king's pleasure all further proceedings in the cause should be stayed till the judges could have an opportunity of conferring with his majesty on the subject. At Coke's desire a similar intimation was officially sent to all the other judges, and they assembled together for the purpose of consulting as to the course they should pursue. The result of their deliberation was a resolution to act in every respect as though they had received no notice to suspend the proceedings: and a letter was despatched to James, who was then absent from London, containing a firm but respectful remonstrance against the command that had been addressed to them, together with their reasons for not obeying it. The letter, which is signed by all the twelve judges, bears such honourable testimony to their integrity and independence; and the answer of James is so characteristic of the notions entertained by that weak monarch on the subject of his prerogative, that both deserve to be quoted at length.

"Most dread, and most gracious Sovereign

"It may please your most excellent majesty to be advertised that this letter here inclosed was delivered unto me your chief justice, on Thursday last in the afternoon, by a servant of your majesty's attorney-general; and letters of the like effect were on the day following sent from him by his servant to us your majesty's justices of every of the courts at Westminster. We are, and ever will be ready with all faithful and true heart, according to our bounden duties, to serve and obey your majesty, and think ourselves most happy to spend our times and abilities to do your majesty true and faithful service in this present case mentioned in this letter. What information hath been made unto you, whereupon Mr. Attorney doth ground his letter, from the report of the Bishop of Winton, we know not; this we know, that the true substance of the cause summarily is this: it consisteth principally upon the construction of two acts of parliament, the one of the twenty-fifth year of King Edward III, and the other of the twenty-fifth year of King Henry VIII, whereof your majesty's judges, upon their oaths, and according to their best knowledge and learning, are bound to deliver their true understanding faithfully and uprightly; and the case between two for private interest and inheritance earnestly called for justice and expedition. We hold it our duty to inform your majesty, that our oath is in these express words: that in case any letters come unto us contrary to law, that we do nothing by such letters but certify your majesty thereof, and go forth to do the law, notwithstanding the same letters. We have advisedly considered of the said letter of Mr. Attorney, and with one consent do hold the same to be contrary to law, and such as we could not yield to the same by our oath; assuredly persuading ourselves that your majesty being truly informed that it standeth not with your royal and just pleasure to give way to them, and knowing your majesty's zeal to justice to be most renowned, therefore we have, according to our oaths and duties, at the very day prefixed the last term, proceeded, and thereof certified your majesty, and shall ever pray to the Almighty for your majesty in all honour, health, and happiness, to reign over us."

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* *Quare impedit;* literally, *wherefore he prevents.* These two words give the name to the writ in which they occur. It is granted against any one who, by wrongfully procuring a clerk to be instituted in a vacant benefice, *prevents* the real proprietor of the advowson from exercising his right of presentation.

Serjeant's Inn, 25th April, 1616.

"James Rex,

"Trusty and well-beloved counsellors, and trusty and well-beloved, we greet you well. We perceive, by your letter, that you conceive the commandment given you by our attorney-general in our name to have proceeded upon wrong information: but if you list to remember what princely care we have ever had, since our coming to this crown, to see justice duly administered to our subjects with all possible expedition, and how far we have ever been from urging the delay thereof in any sort, you may safely persuade yourselves that it was no small reason that moved us to send you that direction. You might very well have spared your labour in informing us of the nature of your oath, for although we never studied the common law of England, yet we are not ignorant of any points which belong to a king to know; we are therefore to inform you hereby, that we are far from crossing or delaying any thing which may belong to the interest of any private party in this case; but we cannot be contented to suffer the prerogative royal of our crown to be wounded, through the sides of a private person: we have no care at all which of the parties shall win this process in this case, so that right prevail, and that justice be truly administered. But on the other side we have reason to foresee that nothing be done in this case which may wound our prerogative in general; and therefore so that we may be sure that nothing shall be debated amongst you which may concern our general power of giving *commendams*, we desire not the parties to have one hour's delay of justice: but that our prerogative should not be wounded in that regard for all times hereafter, upon pretext of private persons' interest, we sent you that direction, which we account as well to be wounded if it be publicly disputed upon, as if any sentence were given against it; we are therefore to admonish you that, since the prerogative of our crown hath been more boldly dealt withal in Westminster Hall, during the time of our reign, than ever it was before in the reigns of divers princes immediately preceding us, that we will no longer endure that popular and unlawful liberty; and therefore we were justly moved to send you that direction to forbear to meddle in a cause of so tender a nature till we had further thought upon it. We have cause indeed to rejoice at your zeal for your speedy execution of justice; but we would be glad that all our subjects might so find the fruits thereof as that no pleas before you were of older date than this is. But as to your argument, which you found upon your oath, you give our predecessors, who first founded the oath, a very charitable meaning, in perverting their intention and zeal to justice, to make a weapon of it to use against their successors; for although your oath be, that you shall not delay justice between any private persons or parties, yet it was not meant that the king should thereby receive harm before he be forewarned thereof; neither can you deny but that every term you will, out of your own discretions, for reasons known unto you, put off either the hearing or determining of any ordinary cause betwixt private per-sions till the next term following. Our pleasure therefore is, who are the head and fountain of justice under God in our dominions, and we out of our absolute power and authority royal do command you, that you forbear to meddle any further in this plea till our coming to town, and that out of our own mouth you hear our pleasure in this business, which we do out of the care we have, that our prerogative may not receive an unwitting and indirect blow, and not to hinder justice to be administered to any private parties, which no importunities shall persuade us to move you in. Like as only for the avoiding of the unreasonable importunity of suitors in their own particular, that oath was by our predecessors ordained to be ministered unto you. So we wish you heartily well to fare.

"*Postcript.*—You shall, upon the receipt of this letter, call our attorney-general unto you, who will inform you of the particular points which we are unwilling to be disputed of in this case."

Shortly after this correspondence the king returned to London, and the twelve judges were immediately summoned before the council at Whitehall (June 6th, 1616) to answer for their conduct. His majesty himself recapitulated the principal circumstances that had occurred, and commented with much asperity on the liberties that had been taken with his prerogative. With the formal pedantry for which he was conspicuous, he divided the charges against them into faults of matter and manner, and those of matter he distinguished into faults of omission and of commission. The omission consisted in not interrupting and reproving the barrister who had presumed to argue against his prerogative. "He had observed," he said, "that ever since his coming to the crown the popular sort of lawyers had been the men that most affrontedly in all parliament had trodden upon his prerogative, which being most contrary to their vocation of any men, since the law or lawyers can never be respected if the king be not reverenced; it did therefore best become the judges of any, to check and bridle such impudent lawyers, and in their several benches to disgrace them that bear so little respect to their king's authority." The faults of commission chiefly regarded the letter, to which he took exceptions both in matter and form; in matter, because he affirmed that the delay which had been required was neither unnecessary nor unjust, that it was merely sufficient for maturity of advice; and that there could not be a more urgent cause for staying the proceedings, than the consulting with the king in a case which so nearly concerned the crown. "As for the form of the letter, his majesty noted that it was a new thing, and very indecent and unfit for subjects to disobey the king's commandment, but most of all to proceed in the mean time and to return to him a bare certificate; whereas they ought to have concluded with the laying down and representing of their reasons modestly to his majesty why they should proceed, and so to have submitted the same to his princely judgment, expecting to hear from him whether they had given him satisfaction."

The report of the proceedings in council, from which the above statement is extracted, goes on to say, that immediately after this declaration of the king the twelve judges fell on their knees and acknowledged their error as to the form of the letter, for which they craved his majesty's gracious favour and pardon; but that Sir Edward Coke entered into a defence of the matter of it, showing that the delay required would have been a delay of justice, and therefore contrary to law and the judge's oath. After some little altercation between the attorney-general and the lord chief justice, this point was referred to the decision of Lord Ellesmere, who gave it as his opinion that the stay which had been required by his majesty was not against the law nor the judge's oath. The judges were then severally asked, "Whether if at any time, in a case depending before them, his majesty conceived it to concern him either in power or profit, and thereupon required to consult with them, and that they should stay proceedings in the mean time, they ought not to stay accordingly?" and they all, with the exception of the lord chief justice, declared that they would. But Sir Edward Coke contented himself with answering that "when the case should be he would do that which should be fit for a judge to do." They were afterwards dismissed; his majesty commanding them "to keep the bounds and limits of their several courts, not to suffer his prerogative to be wounded by rash and unadvised pleading before them, or by new invention of law; for as he well knew the true and ancient common law is the most favourable for kings of any law in the world, so he advised them to apply their studies to that ancient and best law, and not to extend the power of any other of their courts beyond their due limits, following the precedents of their best ancient judges, in the times of the best government; and that then they might assure themselves that he, for his part, in his protection of them, and expediting of justice, would walk in the steps of ancient and best kings." They were then permitted to proceed in the cause, which was finally decided against the Bishop of Litchfield and Coventry.

It is not to be supposed that this unjustifiable attempt to corrupt the fountain of public justice could have been made without exciting among a large portion of the community a strong feeling of disgust and disaffection towards the government under which it had originated. But we should greatly exaggerate the effect which this transaction must have had on the minds of the people at large, were we to estimate it according to what we might conceive would be the probable consequences of a similar occurrence in our own times. The press did not distribute periodically to the remotest corners of the kingdom a knowledge of those affairs in which every member of the state is concerned; nor was this attack on the liberties of the people of a nature such as necessarily to attain (like the case of the ship money, for example) immediate publicity. But this adds to the merit of Coke. He could not have been excited to act thus by the mere wish of courting popularity. Unfortunately, too, had he been inclined to search for precedents of corruption among his predecessors on the bench, by way of authorizing his compliance with the king's wishes, he would have found many instances well suited to his purpose. Indeed, obedience to the will of the sovereign was considered, in some sort, the duty of the judges, at a time when they held their offices by no safer tenure than the meanest servant of his household. Sir Edward Coke was perhaps the first who set the example of strict independence on the bench. After the Stuarts were finally driven from the throne, and a rational system of civil liberty had been established, it was wisely considered, that the surest method of ensuring for the future the just and impartial administration of the laws, would be to maintain, in their utmost purity, the independence, the integrity, and the dignity of the judges. Accordingly, during the reign of William III., it was enacted, that only the address of both houses of parliament should be capable of procuring their removal from the bench. Unfortunately for James, and still more so for his successor, they could never understand (what it now needs no argument to prove) that the honour of the crown and the liberty of the subject can mutually support each other.

The firm and resolute conduct of the lord chief justice had given great umbrage to the king. It is supposed that this weak monarch, in addition to his other reasons for being displeased with Coke, had a mean jealousy of the popularity he had acquired. It was evident, indeed, that the fearless integrity which had thwarted his majesty's views was the principal cause of that popularity; and the circumstance did not escape the attention of James, who afterwards remarked that Sir Edward Coke had obtained it without "having in his nature one part of those things which are popular in men, being neither civil, nor affable, nor magnificent." He had, however, taken the surest means to acquire the lasting and deserved esteem of his countrymen. This was not the only occasion on which he had protected the rights of the nation against the arbitrary and unconstitutional encroachments of that prerogative, the undue exercise of which alienated from James the affections of his people, and brought his successor to the scaffold. He had more than once countenanced appeals to the King's Bench from the judgments of the commissioners of sewers, for whom, it is well known, extraordinary and illegal powers had been created. The privy council subsequently claimed the sole right of hearing complaints against these commissioners, and several persons who had brought actions against them at common law were committed to prison; but these violent measures, though not openly resisted, were sufficiently censured by the public opinion to recall the memory of the obligations due to him who had upheld the rights of the people. However, those actions which were calculated to excite the esteem or the admiration of the friends of civil liberty, were exactly those which were most likely to injure the author of them in the favour of James; and the conduct of Coke, with regard to the commissioners of sewers, had been such as particularly to draw down on him the enmity of the council.

Nor were these the only clouds that were lowering over him. In the preceding year, in his capacity of lord chief justice, he had been actively and zealously engaged in the investigation of the circumstances connected with the atrocious murder of Sir Thomas Overbury. In the course of the inquiry which took place relative to this assassination it was proved that it had been perpetrated by the favourite, Somerset, and Lady Essex, between whom Overbury had discovered, and endeavoured to prevent, an illicit intercourse. The circumstances of the case were peculiarly revolting. The victim of their resentment had been, under some slight pretext, conveyed a prisoner to the Tower; and the lieutenant-governor was induced to become a party to the plot that was laid for his destruction. After several ineffectual attempts, he was at length killed by a violent poison. The crime remained some years unpunished, but at length a strict inquiry was set on foot. It was found that several subordinate agents had been participators in it, and these suffered the death they had justly deserved. Somerset and Lady Essex escaped with their lives; but the downfal of the favourite was the consequence of the discovery; and Coke, who had been indefatigable in his endeavours to detect the perpetrators of the crime, was consequently in no small degree instrumental in procuring his disgrace. It is needless to add that this made him many and very powerful enemies; and it is not to be supposed but that they availed themselves of the opportunity which now presented itself for poisoning the ear of the king against him. Indeed, James himself is supposed to have harboured a deep feeling of resentment against the lord chief justice, on account of certain mysterious hints which are said to have escaped him during the trial of Somerset and his accomplices. It is certain that whispers concerning some secret transaction in which the king was implicated, had been circulated about the court soon after the institution of legal proceedings against the murderers of Sir Thomas Overbury; and many have not scrupled to believe (though without much foundation for the story) that they related to the poisoning of the hope of the nation, the young prince Henry; a crime very generally attributed at the time to Viscountess Rochester, though James (however unjustly) has not entirely escaped the suspicion of being privy to the death of his own son. It was natural that the persons who credited and gave countenance to such rumours should be personally odious to the king, nor is it improbable that such a motive should have weighed with him even stronger than political reasons, when he determined on removing Coke from his post. Sir George Villiers also, who afterwards became Duke of Buckingham, having been thwarted by the chief justice in his endeavours to procure the reversion of a lucrative situation in the court of King's Bench, did not neglect an occasion so favourable for the exercise of his resentment, which his influence with James rendered sufficiently formidable. All these circumstances combined to produce Sir Edward Coke's disgrace; but the avowed cause of it was his conduct in the case of the *commendams*. For this he was arraigned in the privy-council. The accusation against him was reduced to three heads: 1. an act done; 2. speeches of high contempt uttered in the seat of justice; 3. uncomely and undutiful carriage in the presence of his majesty, the privy-council, and judges. These charges having been officially notified to him, on the 30th of June, 1616, he was again summoned before the council, where, on his knees, he received intimation of the sentence which the king had passed on him. The substance of it was, that he should be sequestered from the council-table till his majesty's pleasure was further known; that he should forbear from riding his summer circuit as justice of assize; and that, during the vacation, he should employ his leisure in revising and correcting his Reports, in which the pedantic despot, James, declared that Coke had uttered for law many dangerous conceits of his own, to the prejudice of his crown, parliament, and subjects. It will scarcely be credited, that one of the charges brought against the lord chief justice was, that his coachman used to ride bareheaded before him; a mark of dignity which it was said he was by no means entitled to assume, and of which the earl marshal must take notice. To this Sir Edward Coke (very innocently no doubt) replied, that his coachman did so for his own convenience, and not in consequence of any orders having been given him to that effect. A few months afterwards (Nov. 16th) he was altogether removed from the chief justiceship, and his place was supplied by Sir Henry Montague, the recorder of London. It is worthy of observation, that the new judge was not appointed until he had entered into a written engagement with Buckingham, by which he agreed to put the trustees of the favourite in possession of the situation he had been deprived of through the influence of Sir Edward Coke. This fact sufficiently shows what was the principal cause of Coke's removal from the bench. It may also in some measure explain why he was first suspended, and afterwards entirely removed; the intermediate time being no doubt left him to propitiate the good grace of Buckingham by submission to his wishes. If this be the case, it must reflect eternal honour on Coke, that he preferred renouncing his office altogether to procuring his continuance in it by unworthy means. This is one of a thousand instances in which proud integrity has fallen a sacrifice to the machinations of interested cabal and court intrigue.

Coke, however, did not remain long in disgrace. Some time before his removal from the bench, a negotiation had been set on foot concerning the marriage of his youngest daughter with Sir John Villiers, the brother of the Earl of Buckingham. He had then refused his consent to the match; but it is to be supposed, that the growing influence of the favourite, and the change that had been wrought in his own fortune, afterwards made him sensible of the advantages to be derived from so powerful an alliance, so that he was not indisposed to listen to a renewal of the same overtures, when a change in the relative situation of both parties had rendered an union between them more desirable. As to the sentiments the young lady herself might entertain on the subject, they appear not to have been thought worthy of the slightest consideration. Coke had himself consulted his interest alone in his own marriage with Lady Hatton, from whom he had long lived almost wholly estranged; and he was not of a character to sacrifice his own advancement to the inclination of his daughter. It was through the medium of Secretary Winwood that the match was at length effected. That minister had felt himself offended by a certain tone of superiority which Bacon, on being promoted to the office of lord keeper, had thought proper to assume towards him; and it thenceforward became his study to raise up Coke from the disgrace into which he had fallen. With this view he obtained permission to renew the negotiation which had before been broken off, relative to the alliance with the family of the favourite. Buckingham, tempted by the offer of a large marriage portion which Coke promised with his daughter, immediately consented to the match; but it was not effected without considerable difficulty. Lady Hatton, who was always at variance with her husband, had a dislike to a connexion with the family of the Villiers, and was probably offended that she had not been in the first instance made privy to the negotiation. As she was a woman of masculine spirit, she determined to oppose the match; and accordingly, after pretending in vain to allege a contract with Lord Oxford, as a reason why the marriage could not take place, she caused her daughter to be secretly conveyed to the house of Sir Edmund Withipole, near Oatlands, whence she was afterwards removed to a residence of the Lord of Argyle's, in the neighbourhood of Hampton Court. Sir Edward, on finding his daughter had been sent from home, applied for a warrant to reclaim her; but in the mean time becoming acquainted with the place of her concealment, he determined on instantly rescuing her by force. Accompanied, accordingly, by his son and by about a dozen well armed men he proceeded to Hampton Court, tore down the doors of the house where she was confined, and carried her away. Lady Hatton having no other means of redress, appealed to the privy council; and thus this domestic quarrel became at length an affair of state.

The lord keeper, Bacon, used every exertion to prevent the match, which he was aware would be the means of reestablishing Coke in the king's favour. It is supposed to have been at his instigation that proceedings were instituted in the Star-Chamber against the perpetrator of this outrage, as the forcible rescue was affectedly called; though he could not but know that it was an act perfectly justifiable by law. This was not the only step he took towards breaking off the intended marriage. The following letter was addressed by him to the Earl of Buckingham:—

My very good Lord,

I shall write to your lordship of a business which your lordship may think to concern myself; but I do think it concerneth your lordship much more. For as for me, as my judgment is not so weak to think it can do me any hurt, so my love to you is so strong, as I would prefer the good of you and yours before mine own particular. It seemeth Secretary Winwood hath officiously busied himself to make a match between your brother and Sir Edward Coke; and as we hear, he doth it rather to make a faction than out of any great affection to your lordship. It is true he hath the consent of Sir Edward Coke, (as we hear,) upon reasonable conditions for your brother, and yet not better than without question may be found in some other matches. But your mother's consent is not had, nor the young gentlewoman's, who expecteth a great fortune from her mother, which without her consent is endangered. This match, out of my faith and freedom to your lordship, I hold very inconvenient both for your brother and yourself.

First, he shall marry into a disgraced house, which in reason of state is never held good.

Next, he shall marry into a troubled house of man and wife, which in religion and christian discretion is disliked.

Thirdly, your lordship will go near to lose all such your friends as are adverse to Sir Edward Coke, (myself only excepted, who out of a pure love and thankfulness shall ever be firm to you.)

And lastly and chiefly, (believe it,) it will greatly weaken and distrust your service. For though in regard of the king's great wisdom and depth I am persuaded those things will not follow, which they imagine; yet opinion will do a great deal of harm and cast the king back, and make him relapse into those inconveniences which are now well on to be recovered.

Therefore my advice is, and your lordship shall do yourself a great deal of honour, if, according to religion and the love of God, your lordship will signify unto my lady your mother that your desire is that the marriage be not pressed or proceeded in without the consent of both parents; and so either break it altogether, or defer any further delay in it till your lordship's return. And this the rather for that (besides the inconvenience of the matter itself) it hath been carried so harshly and inconsiderately by Secretary Winwood, as for doubt that the father should take away the maiden by force, your mother to get the start hath conveyed her away secretly, which is ill of all sides. Thus, hoping your lordship will not only accept well, but believe my faithful advice, who by my great experience in the world must needs see further than your lordship can, I ever rest, your lordship's true and most devoted friend and servant, FRANCIS BACON.

In another letter which he wrote to the king on the same subject, the following passage occurs:

"Your majesty's prerogative and authority have risen some just degrees above the horizon more than heretofore; which hath dispersed vapours: your judges are in good temper, your justices of peace (which is the great body of the gentlemen of England) grow to be loving and obsequious, and to be weary of the humour of ruffling: all mutinous spirits grow to be a little poor, and to draw in their horns; and not the less for your majesty's disauctorizing the man I speak of. Now then I reasonably doubt that if there be but an opinion of his coming in with the strength of such an alliance, it will give a turn and relapse in men's minds into the former state of things, hardly to be holpen, to the great weakening of your majesty's service."

Again: "he is by nature unsociable, and by habit popular, and too old to take a new plye. And men begin already to collect, yea, and to conclude that he that raiseth such a smoke to get in, will set all on fire when he is in."

The lord keeper was not content with taking such measures as these: he even ventured to threaten Winwood with a *præmunire* for having granted the warrant. But in this he went too far. Buckingham was highly incensed with his conduct, and even the king, who was on his return from Scotland, wrote him a severe letter on the subject (25th July, 1617.) "Every wrong," he said, "must be judged by the first violent and wrongous ground, whereupon it proceeds. And was not the thefteous stealing away of the daughter from her own father the first ground whereupon all this great noise hath since proceeded? For the ground of her getting again came upon a lawful and ordinary warrant, subscribed by one of our council, for redress of the former violence; and except the father of a child might be proved to be either lunatic or idiot, we never read in any law that either it could be lawful for any creature to steal his child from him, or that it was a matter of noise and streperous carriage for him to hunt for the recovery of his child again. Whereas you talk of the riot and violence committed by him, we wonder you make no mention of the riot and violence of them that stole away his daughter, which was the first ground of all that noise, as we said before. For a man may be compelled by manifest wrong beyond his patience; and the first breach of that quietness, which hath ever been kept since the beginning of our journey, was made by them that committed the theft. And for your laying the burden of your opposition upon the council, we meddle not with that question; but the opposition, which we justly find fault with you, was the refusal to sign a warrant for the father to the recovery of his child, clad with those circumstances, as is reported, of your slight carriage to Buckingham's mother, when she repaired to you upon so reasonable an errand. What farther opposition you made in that business, we leave it to the due trial in the own time. But whereas you would distinguish of times, pretending ignorance either of our meaning or his, when you made your opposition; that would have served for a reasonable excuse not to have furthered such a business till you had been first employed in it; but that can serve for no excuse of crossing any thing that so nearly concerned one, whom you profess such friendship unto. We will not speak of obligation; for surely we think, even in good manners, you had reason not to have crossed any thing, wherein you had heard his name used, till you had heard from him. For if you had willingly given your consent and hand to the recovery of the young gentlewoman; and then written both to us and to him what inconvenience appeared to you to be in such a match; that had been the part indeed of a true servant to us, and a true friend to him. But first to make an opposition, and then to give advice by way of friendship, is to make the plough go before the horse." It appears that at this time, or at least very shortly after it, Coke was reinstated (probably by the mediation of the favourite) in the good graces of his majesty, whose party he joined as it returned from Scotland. On the 3d of September, Sir Henry Yelverton, who was also among the king's followers, wrote to the lord keeper from Daventry, warning him of the danger he had incurred by his opposition to Buckingham. In the same letter he remarks: "Sir Edward Coke, as if he were already upon his wings, triumphs exceedingly; hath much private conference with his majesty; and in public doth offer himself, and thrust upon the king, with as great boldness of speech as heretofore. It is thought, and much feared, that at Woodstock he will again be recalled to the council table; for neither are the earl's ears, nor his thoughts, ever off him." This report was not without foundation; for on the very day of the king's arrival in London (15th September, 1617) the late lord chief justice was restored to his place in the privy council. Whatever obstacles still remained in the way of the marriage were now finally removed. Proceedings had been instituted in the star-chamber, at the suit of Lady Hatton, against her husband; but they had been arrested by the king's order; and she was for some time placed in confinement. At length Lady Compton, the Earl of Buckingham's mother, prevailed on her to discontinue the action, and finally to give her consent to the match, which was accordingly concluded with great pomp.

Sir Edward Coke, however, still remained at variance with his wife. Their quarrels were not merely the effect of occasional ebullitions of temper, such as may disturb the domestic comforts of a family for awhile, without causing any permanent disunion among the members of it. Lady Hatton was a woman of a haughty and imperious character, who was constantly on the watch for opportunities to remind her husband how much he was indebted to her for the honour and the wealth he had derived from her alliance. On the other hand, the deportment of Sir Edward Coke had nothing conciliatory in it; and, indeed, if we are to form our opinion of his temper from the ebullitions of it which he could not control even in public, it was very far from being of a nature to render him, under any circumstances, an amiable husband or father of a family. Domestic happiness they never enjoyed together. They had separate houses and separate establishments; Sir Edward occasionally occupying his chambers in the Temple, while his lady fixed her residence at Hatton House, in Holborn; or retiring to his seat at Stoke Pogies, in Buckinghamshire, (the same which is now the residence of the descendant and representative of the celebrated William Penn,) when she either remained in London, or tenanted her mansion of Corfe Castle. Among other subjects of angry contention between them, these different dwellings and their appurtenances formed a fertile theme for dispute. At one time we find Sir Edward publicly accusing his wife of having purloined his plate, and substituted counterfeit *alkumy* in its place, with intent to defraud him. On another occasion, Lady Hatton complains of his seizing her coach, coach-horses, and wearing apparel, maltreating her servants, and causing her to suffer "beyond the measure of any wife, mother, or even any ordinary woman in the kingdom." It might be supposed that when she had been persuaded to give her consent to her daughter's union with Villiers, some show at least of reconciliation with her husband would have taken place; but this was not the case; and the very day on which she gave a magnificent entertainment in honour of the marriage, Sir Edward, uninvited and unnoticed by his wife, dined in the Temple. There exists abundant testimony that their mutual resentment, and it may almost be said hatred, against each other, was cherished for some time after this period. At the end of four years (1621) they were in some degree reconciled by the personal interference of the king, who undertook to be the mediator between them; but they always remained strangers to domestic happiness. As for their daughter, who had from the beginning expressed a strong dislike to Sir John Villiers, her marriage, as might have been expected, was an unhappy one.

So soon as a probability had appeared of Sir Edward's being reinstated in the king's favour, the wary courtier, Bacon, had dropped all appearance of resentment against him; and had even taken the trouble to explain away some parts of his conduct towards him. He was also particularly careful to repair the fault he had committed with regard to Buckingham, by assiduous endeavours to propitiate the good graces of the favourite. A short extract from a letter which he wrote to King James, with the view of deprecating the anger of that monarch occasioned by his opposition to the marriage of Coke's daughter, will sufficiently illustrate these facts. "It is true," he says, "that in those matters which, by your majesty's commandment and reference, came before the table concerning Sir Edward Coke, I was sometimes sharp, it may be too much; but it was with the end to have your majesty's will performed; or else when methought he was more peremptory than became him, in respect of the honour of the table. It is true also, that I disliked the riot or violence, whereof we of our council gave your majesty advertisement by our joint letter: and I disliked it the more, because he justified it to be law; which was his old song. But in that act of council, which was made thereupon, I did not see but all my lords were as forward as myself," &c. And again, alluding to an intimation given him by the Earl of Buckingham, for whom he had just professed his readiness to spend his life, he adds: "After I had received, by a former letter of his lordship, knowledge of his mind, I think Sir Edward Coke himself, the last time he was before the lords, might particularly perceive an alteration in my carriage. And now that your majesty hath been pleased to open yourself to me, I shall be willing to further the match by any thing, that shall be desired of me, or that is in my power." In consequence of this disposition, a reconciliation appears to have taken place between the lord keeper and Coke; and accordingly we find no traces of animosity in the conduct of the latter, when, at a subsequent period, (1621,) he was called upon to take a share in the proceedings which terminated in the disgrace of Bacon.

Sir Edward Coke was a member of the parliament which necessity rather than inclination forced the king to summon in 1621; and the same upright and independent spirit, which had done him so much honour in the affair of the *commendams*; again manifested itself in his deportment while he retained his seat in the commons. But here he stood not alone. The representatives of the people, who in former reigns had been without power or influence in the political world, had at length become sensible of their own importance, and had already begun to assert the dignity and independence of their body. Previous to the reign of James I. their assent had indeed been necessary for the enactment of statutes, and the granting of supplies, but they had seldom or never attempted to take cognizance of any concerns of the state that were not immediately connected with these privileges. As to freedom of debate, it was altogether unknown in the assembly. Some faint attempts had been made during the reign of Elizabeth to uphold such a right; but they had been peremptorily checked by the queen; and the great popularity of her government, at a time when she held the parliament in the most strict submission to her will, is a convincing proof that the importance of this body was very far from being adequately appreciated in her time. When the commons ventured to recommend that she would provide for the succession; when they proposed new regulations for the amelioration of the church establishment, or urged the reformation of some flagrant abuses of prerogative, it does not appear to have excited either surprise or indignation that they should be severely reprimanded for their presumption, and be desired not to meddle for the future with what was above their capacity. Even while Sir Edward Coke had been speaker of the house, in 1592, the queen had expressly prohibited the members from arguing on matters of state, and had given them to understand that their freedom of speech extended no farther than the mere utterance of ay or no, without comment or observation. This intimation was not meant as an idle threat. The independent and spirited Peter Wentworth was sent to the Tower for venturing to disregard it; and three other members who had abetted him were also thrown into prison by the queen's order. Their release was not effected by the interposition of the house. Certain privy councillors recommended that the idea of a petition for that purpose should be given up, lest it might only serve to irritate her majesty still further; and this advice, instead of calling forth the indignation of those to whom it was addressed, was not only received with thankfulness and humility, but was moreover acted upon. The idea of steadfastly resisting the arbitrary imprisonment of one of their body, as a breach of their most important privilege, seems never to have been entertained, much less expressed, by the intimidated commons of that period. Indeed their notions in general, whether real or affected, concerning the extent of the royal prerogative, were entirely at variance with just ideas of the liberty of the subject, and consequently of the independence of their own body. To be convinced of this it is sufficient to look over the speeches that were made in the 43d of Elizabeth's reign, particularly when the subject of monopolies was brought under the consideration of parliament; discourses, as Hume has well remarked, more worthy of a Turkish divan than of an English house of commons.

However, the leaven of spirit and of independence which did exist, though it must be allowed in a very small degree, in the parliaments of Elizabeth spread rapidly through the assembly. A difference might be remarked in the temper of the house of commons even towards the latter part of her reign. In the 23d of Elizabeth, they suffered the chancellor to issue new writs for the places of members whom, under any pretext, he might judge incapable of attending their duties; but at a later period this dangerous practice did not escape their censure; and though they were as usual reprimanded by the queen for presuming to meddle in matters which, according to her, were not in their province, they had spirit enough to propose a motion, declaring that the discussion of such cases belonged solely to the house. This privilege of deciding all questions relative to the customs and the constitution of their body, they strenuously asserted in the 2d of James I. insomuch that the king, who at the beginning of the discussion had talked loudly of his absolute power, and the authority of his royal prerogative, found it expedient to propose a compromise of the difference that had arisen between himself and the commons. Even Elizabeth, though she had on all occasions maintained her dignity unimpaired, had more than once found it expedient to make concessions, rather than come to an open rupture with her parliament. At the same time that her messages to the house were conceived in terms of the most haughty and indignant displeasure, it sometimes did not require much penetration to see that a certain degree of fear lurked behind this show of firmness. With James this was much more apparent. We find him, after the example of his predecessor, desiring the parliament not to interfere in matters beyond their capacity; reminding them that all their privileges were derived from the special grace of himself and his ancestors; and maintaining that it was highly impertinent in them even to reason upon what he as an absolute king might do in the height of his power; but these empty speeches were often merely designed as a mask to cover the real apprehensions he could not but feel for the fate of his cherished prerogative. Whatever fears he entertained on the subject, he certainly pursued a method very ill calculated to remove the cause of them. The commons of England were no longer to be frightened into concessions; and when the necessities of the king obliged him to assemble them in 1621, they were fully prepared to resist every attack that might be made on their privileges. The result of the contest which ensued was such as might have been anticipated. The memorable proceedings which took place during the existence of this parliament, and particularly in the second session of it, are familiar to all who are conversant with the history of our constitution. The fruitless attempts of James to crush the rising spirit of liberty which animated the whole nation; the remonstrances made by the representatives of the people; and the unfounded pretensions of the king, who endeavoured to strike at the root of all their privileges, called forth that celebrated protestation of the commons, in which they declared: "that the liberties, franchises, privileges, and jurisdictions of parliament, are the ancient and undoubted birthright and inheritance of the subjects of England." In all these proceedings, Sir Edward Coke, who was one of the leading members on the popular side, took an active part; and the consequence was, that he was committed to the Tower, (27th December, 1621,) and subsequently dismissed from the privy council. He had been treated with much distinction and confidence ever since he had been reinstated to his place at the council table; and it has been doubted what motive could induce him so suddenly to become an opponent of the interests of the crown. But it should be recollected, that the change was in reality by no means a sudden one. His conduct, not only in the case of the *commendams*, but on many other occasions, had proved that he was an enemy to the arbitrary exercise of the royal perogative; and it must be allowed, that the evident intentions of infringing on the liberties of the people, which were continually displayed by the king, but more particularly about the time when the parliament was first called, were calculated to inspire every real friend of his country with a resolution to oppose them.

James was highly incensed at the audacity which Coke had shown in opposing the crown; and several expedients were tried, in order to punish indirectly what it would have been imprudent and dangerous to visit openly with a heavy infliction. On Sir Edward's committal to the Tower, his chambers were broken open, and his papers seized, probably with the hope of discovering some writings which might furnish matter for a criminal prosecution. This expectation, however, was disappointed; and two other attempts which were made to injure him, (the one by endeavouring to prove him guilty of misconduct during the trial of Somerset, the other by a prosecution for debt,) succeeded no better. Some years afterwards, (1625,) his independent spirit again excited the resentment of the court against him; and he was ordered by the king to execute a commission in Ireland; an unjustifiable pretext often resorted to at that time, for the purpose of removing obnoxious persons. However, his departure from England does not appear to have been eventually insisted upon, and his popularity was, in all probability considerably increased by the expectation of his compulsory absence.

On the accession of Charles I. to the throne, Sir Edward Coke was among the number of those who waited on him with assurances of respect and loyalty; but the new monarch refused him admission to his presence; and that he might be prevented from resuming his seat in parliament, he was afterwards appointed high sheriff for Buckinghamshire. It was to no purpose that he urged several objections against his serving the office; they were overruled by the council, and he was compelled to yield. It will be remarked, that such a situation as that of high sheriff, however honourable and distinguished it may be usually considered, could not be filled by one who had lately occupied the station of lord chief justice, without his being subjected to a mortifying exhibition of his fallen fortunes; since his duty at the assizes required him to attend on the judges, who had so recently been his inferiors; and it is more than probable that his enemies at court had calculated on exposing him to this insult, when they forced him to accept the charge. It was not till the year 1628, that he again became a member of the House of Commons. He took his seat as knight of the shire for Bucks, being at the time in his seventy-ninth year; and, notwithstanding his advanced age, bore a leading part in the proceedings that took place during that memorable session. It was then that the commons of England, united as in one common cause, first made a resolute and successful resistance against those encroachments of the royal perogative, which, if ratified by the acquiescence of the nation, would have reduced the freedom of our constitution to a mere shadow. The grievances that called loudly for redress were heavy and numerous. Those which most particularly excited the indignation of parliament were the extortions of various kinds, by which the security of the subject's property had been invaded, and the despotic violation of his personal liberty by arbitrary and illegal imprisonment. The unconstitutional means which had been employed for the raising of subsidies, such as the billeting of soldiers, and the exaction of loans by benevolence and privy seal, were the first of these topics that came under discussion; and Sir Edward Coke was one of the members who took the greatest share in the debate to which it gave rise. An extract from his speech on this occasion, will serve the double purpose of showing the manly independence of his sentiments, and the peculiarity of his style of oratory. "Let us not flatter ourselves," he said: "who will give subsidies if your king may impose what he will; and if, after parliament, the king may enhaunce what he pleaseth? I know your king will not do it; I know he is a religious king, free from personal vices; but he deals with other men's hands, and sees with other men's eyes. Will any give a subsidy that will be taxed after parliament at pleasure? Your king cannot tax by way of loans. I differ from those who would have this of *loans* go amongst grievances; but I would have it go *alone*. I will begin with a noble record: it cheers me to think of it—25 Edward III.; it is worthy to be written in letters of gold. Loans against the will of the subject are against reason, and the franchises of the land, and they desire restitution. What a word is that franchise? The lord may tax his villain high and low, but it is against the franchises of the land for freemen to be taxed but by their consent in parliament. Franchise is a French word, and in Latin it is *libertas*. In *Magna Charta* it is provided that: *Nullus liber homo capiatur, vel imprisonetur, aut disseisietur de libero tenemento suo, &c., nisi per legale judicium parium suorum, vel per legem terræ.** Which charter hath been confirmed by good kings above thirty times."

The result of this debate was a vote of the house declaring: "That it is the ancient and indubitable right of every freeman, that he hath a full and absolute property in his goods and estate; that no tax, tallage, loan, benevolence, or other like charge, ought to be commanded or levied by the king, or any of his ministers, without common consent by act of parliament."

Before this spirited declaration of the house had been made, some persons who had refused to obey the order for a loan had been committed to prison, solely on the king's order; the privilege of the *habeas corpus* had formally been disallowed them by the courts, and it had been declared that a person confined by the royal authority could not be bailed. On this subject Sir Edward Coke expressed himself thus: "What is this," said he, "but to declare upon record that any subject committed by such absolute command, may be detained in prison for ever? What doth this tend to, but the utter subversion of the choice, liberty, and right belonging to every free-born subject of this kingdom? I fear, were it not for this parliament that followed so close after the form of judgment was drawn up, there would have been hard putting to have had it entered; but a parliament brings judges, officers, and all men into good order." The discussion being resumed on a subsequent day, in the course of his speech, Coke said: "It is a maxim, the common law hath admeasured the king's prerogative, that in no case it can prejudice the inheritance of the subjects. Had the law given the prerogative to that which is taken, it would have set some time to it, else mark what would follow. I shall have an estate of inheritance for life or for years in my land, or propriety in my goods, and I shall be tenant at will for my liberty: I shall have propriety in my own house, and not liberty in my person. *Perspicue vera non sunt probanda.* The king hath distributed his judicial power to courts of justice and to ministers of justice. It is too low for so great a monarch as the king is to commit men to prison; and it is against law, that men should be committed, and no cause shewed. I would not speak this, but that I hope my gracious king will hear of it: yet it is not I, Edward Coke, that speaks it, but the records that spake it. We have a national appropriate law to this nation, *divisis ab orbe Britannis.* I will conclude with the Acts of the Apostles, ch. 25. *It is against reason to send a man to prison, and not to show the cause.*"

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* No freeman shall be taken, or imprisoned, or deprived of his freehold, but by the lawful judgment of his peers, or the law of the land.

After this speech, on the question being put, it was resolved:

I. That no freeman ought to be detained or kept in prison, or otherwise restrained by the command of the king, or privy council, or any other, unless some cause of the commitment, detainer, or restraint be expressed, for which by law he ought to be committed, detained, or restrained.

II. That the writ of *habeas corpus* may not be denied, but ought to be granted to every man that is committed or detained in prison, or otherwise restrained, though it be by the command of the king, the privy council, or any other, he praying the same.

III. That if a freeman be committed or detained in prison, or otherwise restrained by the command of the king, privy council, or any other, no cause of such commitment, detainer, or restraint, being expressed, for which by law he ought to be committed, detained, or restrained, and the same be returned upon a *habeas corpus* granted for the said party, then he ought to be delivered or bailed.

Sir Edward Coke joined in framing not only these, but several other spirited remonstrances which the king's arbitrary conduct called forth from the representatives of the nation; and it is well known that they were not contented with remonstrances alone. The *Petition of Rights* was their work; and for this celebrated statute, which forms one of the proudest epochs in the history of the English constitution, we are partly indebted to his exertions. He was also principally instrumental in procuring that earnest remonstrance against the Duke of Buckingham, which was in effect directed against all the measures that had been pursued by the ministry. Shortly afterwards, the session of parliament was brought to a close, and with it finished his public career.

The remainder of his life was spent in retirement, chiefly at his house at Stoke-Pogies, in Buckinghamshire, where he enjoyed that high consideration and respect to which his talents, his character, and his station in society justly entitled him. But even in his last retirement his active mind was not without employment; and it may reasonably be conjectured that a great part of his time was devoted to the revisal of the works he left behind him unpublished. To the end of his life, though secluded from politics and from the world, he was looked upon by the court with an eye of jealousy and suspicion. While he was on his death-bed, his house was searched for seditious writings, and his numerous manuscripts, together with his will, were carried away. The former were not restored to his family till ten years afterwards; and the latter was never given up. He closed his long and useful career (September 3rd, 1634,) exclaiming in his last moments: "Thy kingdom come, thy will be done." His remains were interred in the church of Titeshall in Norfolk, the family burial place of the Coke family.

Sir Edward Coke was gifted with the advantages of a fine person and commanding appearance. The bust of him which is preserved in the library at Trinity College, Cambridge, and the portrait which hangs in the hall of Lyon's Inn, represent him as having handsome and regular features, with a gravity of countenance to which the costume of his time, and particularly the long pointed beard, did not a little contribute. He was at all times particularly attentive to his apparel and general personal appearance, holding it for a maxim that the exterior neatness of the body ought to be emblematic of the inward soul's purity. It may be considered perhaps a proof rather of his honest pride in having fearlessly performed his duty, than of his taste for show and ornament in dress, that he refused to part with his judge's collar on his removal from the bench, alleging as his reason. that he would leave it to his posterity for a memorial that they had a chief justice among their ancestors. He used to boast that all his honours had been obtained without bribery or solicitation *(nec prece nec pretio,)* and would often give solemn thanks to God that he never gave his body to physic, his heart to cruelty, nor his hand to corruption. In his habits and manner of living Coke appears to have indulged in a little eccentricity. He was more exclusively a lawyer than most of his contemporaries, who were wont to relax from their severer studies in the occasional pursuit of lighter and more agreeable occupations. Music, dancing, fencing, and all the minor accomplishments considered necessary to perfect the education of a gentleman, were in his time regularly taught in the inns of court, which were placed very much on the same footing as our universities are at present; the members, and particularly the students, being subjected to many other restraints, besides that of attending hall during term, now almost the only remaining vestige of academical discipline. We are not informed that Coke at any time distinguished himself (as many great lawyers have done) in the diversions and entertainments so frequently presented by the members of the inns of court. Indeed, his mind appears not to have been endowed in any degree with the attribute of versatility; and the study or practice of the law engrossed all its energies. If he ever wandered from it, divinity became his theme. Every hour of his time was regularly and systematically apportioned; a method of which those only who have felt the pressure of constant and various employment can fully appreciate the advantages. The six hours of sleep (with which in one of his incidental snatches of advice to his readers, he enjoins the student of law to content himself,) he used to enjoy at a very extraordinary season, making it his constant practice to retire to rest at nine o'clock, and to rise at three. To this custom he was so habituated, that if disturbed during that period he was totally unfit for business all the remainder of the day; insomuch that, if we can rely on the information of his grandson, Roger Coke, his son refused to awaken him before his usual time, even on the arrival of an important express from the king. It is probable that to this extreme regularity of life he was in great measure indebted for the health and longevity he enjoyed.

His family consisted of seven sons and five daughters, two of the latter being by his second wife. The fortune which he left behind him, increased as it had been by two advantageous marriages, by the successful exercise of his profession, and by habits of frugality, was very large; and his descendants have ever since his time been among the most wealthy of the gentry of England. During the reign of George I. his lineal representative in the male line was raised to the peerage, with the title of Baron Lovell, and he afterwards became Viscount Coke and Earl of Leicester. This title now no longer exists, but the present head of the family, Thomas Coke, Esq. of Holkham, in Norfolk, in point of wealth and consequence, may rank with the first commoners of this realm.

After what has been related of Sir Edward Coke's life, it is needless to expatiate on his character. His temper was evidently violent, and his disposition overbearing. In the early part of his career, there were no bounds to his obsequiousness: after he had attained the object of his ambition, it has been seen that his conduct was any thing but that of a servile courtier; a contradiction that can only be accounted for, by supposing him to have been gifted by nature with an independent spirit, between which and his ambition there was a continual struggle. The former, however, ultimately gained the ascendancy; and (to use the expressions of Mr. Hallam) "he became, not without some honourable inconsistency of doctrine as well as practice, the strenuous asserter of liberty, on the principles of those ancient laws which no one was admitted to know so well as himself; redeeming in an intrepid and patriotic old age, the faults which we cannot avoid perceiving in his earlier life."

It has been elsewhere observed of Coke: "His advancement he lost in the same way he got it—by his tongue: so difficult is it for a man very eloquent not to be over-loquent. Long lived he in that retirement to which court indignation had remitted him, yet was not his recess inglorious; for at improving a disgrace to the best advantage he was so excellent, as King James said of him, *he was like a cat, throw her* *which way you will she will light upon her feet.* And finding a cloud at the court he made sure of his fair weather in the country, applying himself so devoutly to popular interest, that in succeeding parliaments the prerogative felt him as her ablest, so her most active opponent."

The patriotism and independence of Sir Edward Coke must ever be considered as the brightest feature in his character. It is as a patriot alone that he stands superior to his great contemporary Bacon, with whom throughout the greater part of his professional career he was placed in constant competition. Both had embraced the same profession, both prosecuted it with ardour and success; one attaining the highest, the other the second dignity it can confer; and both lived to experience the instability of the preferment they had struggled so hard to acquire. But the causes which produced the downfal of these illustrious persons were widely different; and he whose integrity was unimpeached rose highest in public estimation after his disgrace at court; while all the brilliant qualities of his rival, when sullied by corruption, failed to procure him the consideration and esteem that to a generous mind form the most gratifying reward of every exertion. As an author, however, Bacon need fear no comparison with Coke. No one can peruse a production, however slight, of each, without being struck by the wide disparity of their intellects. Bacon was in every respect superior to his age; Coke was merely on a level with it: the former was a philosopher, a statesman, and a lawyer; the latter was a lawyer, and little or nothing more. An absurd opinion is sometimes maintained, that those who devote themselves to the study of the legal profession must sedulously refrain from intercourse with every other department of literature and science. Perhaps no more striking refutation of such a doctrine can be named, than the great superiority of Bacon's legal writings over those of his contemporary. As a practical lawyer, Coke was undoubtedly without an equal. All the abstruse learning of the common law, the subtle niceties of pleading, and the voluminous enactments of the statute-book, were treasured in his memory; and from this copious repertory he could always draw wherewithal to supply the emergencies of a particular case. But he wanted the lamp of philosophy to enlighten the confusion of so many jarring elements. It would have produced such an effect as the first beaming of day is said to have done on chaos; for though in a confined circle he could move with safety, if not with freedom, he was bewildered and lost when he ventured beyond it. His mind resembled a spacious but ill constructed dwelling-house, stored with furniture in abundance and of costly workmanship, which, however, for want of order and arrangement, is deprived of much of its utility, and is often found to be more cumbersome than convenient. The difference we cannot fail to perceive between these distinguished individuals was owing as much to the original dissimilarity of their genius, as to their education and acquired habits of thinking: Coke had not been nurtured in the school of philosophy; and having once fallen into the beaten track of the law, he seems never to have felt a wish to diverge from it: although endowed with a shrewd and penetrating mind, he loved rather to involve himself in the perplexities of detail, and to treasure up a vast number of unconnected facts, than by arranging and combining these, the elements of knowledge, to discover new and hidden truths. He possessed a memory at once powerful and capacious; industry, which no labour could fatigue, and that sobriety and dispassionate temper of mind which no intricacies could disgust, but he was lacking in the higher and more noble faculty of reason, which is the true and only source of all philosophy. In this his great rival, the father of philosophy, eminently excelled; and while Bacon was gaining by a broader and easier ascent, the vantage ground of his profession, he found leisure to indulge the natural versatility of his tastes, and to make those excursions into the fields of literature and of science, by which his fame has become the property of the world. In none of Coke's writings do we find a single attempt to generalize, to discover those great principles of jurisprudence from which most of the principal enactments of positive law have been deduced, or to lay down rules for the guidance of future legislators. He is content to know that certain regulations have been made, and that certain consequences must follow; but he goes no further, or if he attempts to do so, he wanders without a compass. No one, who has perused even the speech of Lord Bacon, on his taking his seat in the Court of Chancery, will require to be told that his manner of treating legal subjects is very different.

It is true that the voluminous writings of Coke have always been classed among the most important that we possess on the laws of this country. "His learned and laborious works on the laws," says Fuller, "will be admired by judicious posterity, while fame has a trumpet left her, and any breath to blow therein." But this eulogium must not be understood to imply that they are worthy to be looked up to as models for imitation, either in point of style or method. Their chief merit consists in the extensive learning and sound legal information which they contain; but this is imparted in such a negligent and slovenly manner, as greatly detracts from their value. They resemble a garden filled with the choicest flowers, which, however, are frequently disfigured or concealed by the neighbourhood of weeds and rubbish. That want of order and arrangement, which is their principal fault, seems to have arisen not so much from mere carelessness and inadvertence in the disposition of the subjects to be discussed, as from the peculiar habit of Coke's mind, which made him ever more anxious to exhibit his powers of subtlety and copious illustration in reasoning, than to produce only such arguments as might be apposite and well timed. Hence his digressions are not only frequent but almost interminable; and his arguments are often heaped together till they become tiresome and even puerile. It appears that he was reproached with committing exactly the same faults in extemporaneous speaking. Lord Bacon expresses himself thus on the subject: "In discourse you delight to speak too much, not to hear other men. This, some say, becomes a pleader, not a judge; for by this sometimes your affections are entangled with a love of your own arguments, though they be the weaker, and rejecting of those which, when your affections were settled, your own judgment would allow for strongest. Thus, while you speak in your own element, the law, no man ordinarily equals you; but when you wander, as you often delight to do, you wander indeed, and give never such satisfaction as the curious time requires. This is not caused by any natural defect, but first for want of election, when you, having a large and fruitful mind, should not so much labour what to speak, as to find what to leave unspoken: rich soils are often to be weeded. You cloy your auditory when you would be observed; speech must be either sweet or short."

A few examples shall be given of these defects in the works of Sir Edward Coke. The first that occurs will sufficiently illustrate his manner of digressing, his mania for assigning a reason to every thing, and also the particular tone of quaint pedantry which was in some degree the characteristic of his age. It is taken from his Commentary on Littleton. The author having enumerated the different kinds of tenures and services in the following order: *viz.* homage fealty, escuage, knight's-service, frankalmoigne, homage auncestrell, grand serjeanty, petit serjeanty, tenure in burgage, in villanage, and rents, Coke cannot but find something peculiarly appropriate in the arrangement of these heads. After commenting on the four first, he goes on: "Fifthly, *soccage*, the service of the plough, aptly placed next knight's-service, for that the ploughman maketh the best souldier, as shall appeare in his proper place. Sixthly, *frankalmoigne*, service due to Almighty God, placed towards the middest for two causes; first, for that the middest is the most worthy and most honourable place; and, secondly, because the first five preceeding tenures and services, and the other six subsequent must all become prosperous and usefull, by reason of God's true religion and service; for *Nunquam prospere succedunt res humanæ, ubi negliguntur divinæ*. Wherein I would have our student follow the advice given in these ancient verses for the good spending of the day:

"Sex horas somno totidem des legibus æquis,
Quatuor orabis, des epulisque duas;
Quod superest ultrà sacris largire camœnis."

Co. Litt. 288. a.

Notwithstanding his undisguised contempt for "rhyming poets," this is not the only occasion on which he has thought proper to introduce scraps of Latin verse, and even doggrel, into his legal discussions. Thus, in the following passage: "If the wife elope from her husband, that is, if the wife leaves her husband and tarrieth with her adulterer, she shall lose her dower until her husband, willingly, without coercion ecclesiastical, be reconciled to her, and permit her to cohabit with him; all which is comprehended shortly in two hexameters:

"Sponte virum mulier fugiens, et adultera facta,
Dote suâ careat, nisi sponsi sponte retracta."
Co. Litt. 32. a. 32. b.

Of his very clumsy and inappropriate mode of introducing quotations in his legal writings, it would be difficult to find a more ludicrous example than the passage which occurs in the beginning of his chapter on the jurisdiction of forest courts. (Inst. iv. chap. 73.) "Seeing we are to treat," he says, "of matters of game and hunting, let us (to the end we may proceed the more cheerfully) recreate ourselves with the excellent description of Didoe's doe of the forest wounded with a deadly arrow stricken in her, and not impertinent to our purpose."

Uritur infelix Dido, totâque vagatur
Urbe furens, qualis conjectâ cerva sagittâ,
Quam procul incautam nemora inter Cressia
  fixit
Pastor agens telis, liquitque volatile ferrum
Inscius: illa fugâ sylvas saltusque peragrat
Dictæos, hærot lateri lethalis arundo.[*]

And in a marginal note he compares this wound of the stricken doe to "an evil conscience in the false and furious officer of the forest, if any such be."

His constant disposition to account for every thing by uncommon and singular reasons, is nowhere better exemplified than in his derivations of words. Thus: *Parliament*, he says, is so called, "because every member of that court should sincerely and discreetly *parler la ment* for the general good of the commonwealth." (Co. Litt. 110. a.) "The word *placitum* is derived *à placendo*, *quià benè placitare super omnia placet;* and it is not, as some have said, so called *per antiphrasin*, *quià non placet*." (Ibid. 17. a. 303. a.) "Towne (ville) *villa*, *quasi vehilla*, *quod in eam convehantur fructus*." (Ibid. 115. b.) "ROBBERIE. *Roboria*, properly is when there is a felonious taking away of a man's goods from his person; and it is called robberie, because the goods are taken as it were *de la robe*, from the robe, that is, from the person; but sometimes it is taken in a larger sense." (288. a.) A hundred other such instances might be quoted.

Perhaps there is no quality more conspicuous throughout the writings of Coke than a constant parade of scholastic pedantry. He seldom discusses a subject, however unimportant, without dividing it according to rule under several distinct heads; and it by no means unfrequently occurs that his awkward attempts to establish complete perspicuity create confusion and perplexity where none existed before. It is evident that he was unconscious of this failing. In his preface to the seventh report he says: "In these and the rest of my reports I have (as much as I could) avoided obscurity, ambiguity, jeopardy, novelty, and prolixity. 1. Obscurity; for that it is like unto darkness, wherein a man for want of light can hardly with all his industry discern any way. 2. Ambiguity; where there is light enough, but there be so many winding and intricate ways, as a man for want of direction shall be much perplexed and entangled to find out the right way. 3. Jeopardy; either in publishing of any thing that might rather stir up suits and controversies in this troublesome world than establish quietness and repose between man and man; (for a commentary should not be like unto the winterly sun, that raiseth up greater and thicker mists and fogs than it is able to disperse;) or in bringing the reader by any means into the least question of peril or danger at all. 4. Novelty; for I have ever holden all new or private interpretations or opinions, which have no ground or warrant out of the reason or rule of our books or former precedents, to be dangerous and not worthy of any observation, for *periculosum existimo quod bonorum virorum non comprobatur exemplo*. 5. Prolixity; for a report ought to be no longer than the matter requireth; and as *languor prolixus gravat medicum, ità relatio prolixa gravat lectorem*."

The scholastic method of argument is often clumsily, and sometimes incorrectly, employed by Coke. He was in the habit of falling into that dangerous error, so common among those who use the mechanism of reasoning somewhat carelessly, of being misled by mere verbal subtleties; and in consequence of this failing his style of arguing is not only often loose and perplexed, but occasionally vicious. Instances of this sort may be found in his report of Calvin's case, which also contains examples of the defect before mentioned. The principal question of law brought under the consideration of the court in that celebrated cause was: whether the plaintiff, who had been born in Scotland, after the crown of England had descended to James I., was an alien born, and consequently disabled from bringing any action real or personal for lands within the realm of England. It was observed that there were four nouns, which might be called *nomina operativa*, in the plea, *viz.*: *ligeantia*, (allegiance,) *regnum*, (kingdom,) *leges*, (laws,) and *alienigena* (alien.) Each of these subjects underwent a separate discussion. On coming to the last, the reporter observes· "Now we are in order come to the fourth noun (which is the fourth general part) *alienigena*: wherein six things did fall into consideration. 1. Who was *alienigena*, an alien born by the laws of England? 2. How many kinds of aliens born there were? 3. What incidents belonged to an alien born? 4. The reason why an alien is not capable of inheritance or freehold within England? 5. Examples, resolutions, and judgments reported in our books in all successions of ages, proving the plaintiff to be no alien. 6. Demonstrative conclusions upon the premises, approving the same." After examining the first five points at some length, he comes to the last head, which, he says, comprises "six demonstrative illations or conclusions, drawn plainly and expressly from the premises." Among these six arguments, it does not require much penetration to discover the unsoundness of the following.

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[*] These lines are thus translated by Dryden. (Æneis, book iv.)

Sick with desire, and seeking him she loves,
From street to street the raving Dido roves,
So when the watchful shepherd, from the blind,
Wounds with a random shaft the careless hind,
Distracted with her pain, she flies the woods,
Bounds o'er the lawn, and seeks the silent floods
With fruitless care; for still the fatal dart
Sticks in her side, and rankles in her heart.

"Every stranger must at his birth be *amicus* or *inimicus*; but Calvin at his either birth could neither be *amicus* nor *inimicus*: *Ergo*, he is no stranger born. *Inimicus* he cannot be, because he is *subditus*; for that cause also he cannot be *amicus*· neither now can Scotia be said to be *solum amici*, as hath been said.

"Whatsoever is due by the law or constitution of man may be altered: but natural liegeance or obedience to the sovereign cannot be altered: *Ergo*, natural liegeance or obedience to the sovereign is not due by the law or constitution of man. Again, whatsoever is due by the law of nature cannot be altered; but liegeance and obedience from the subject to the sovereign is due by the law of nature: *Ergo*, it cannot be altered."

The false positions contained in these arguments are not the less glaring for being delivered under the form of syllogisms. It will be remarked that in each of them the *minor* is open to exception. The whole of Calvin's case is an excellent specimen of the pedantry with which not only Coke himself, but by far the greater portion of his legal brethren were infected; and if any one would form an opinion of the cumbrous and unprofitable learning with which lawyers in those days were wont to load their discourses, he can do no better than read it in Coke's report. It was an occasion of very great display, as appears by his account of the vast interest excited, and the elaborate discussion it underwent. All the fourteen judges, (there being then five in both the King's Bench and Common Pleas,) with the Lord Chancellor Ellesmere, argued it, apparently at much length, for only two were heard in each of the eight days during two successive Terms that the debate lasted. Every judge took his own course, as Lord Coke informs us; and yet he confesses there was not much difficulty in the case, but that its importance only made the judges of the King's Bench carry it into the Exchequer chamber, where thirteen of the fourteen were, with the chancellor, clear one way. It was evidently made the occasion of an exhibition, a grand legal exercitation, much to the taste of those times. Now, not only is the discussion filled with the most useless and inapplicable learning, but there is really very little that can be called argument in it. Farfetched analogies, quaint allusions, quibbles upon words, quotations from the scripture and from profane authors, both classical and legal, abound in it; but there is a total want of close reasoning upon principle where principles are introduced. Its only value now lies in the remarks made incidentally upon other points of law foreign to the case at bar.

It is impossible to mention this celebrated case without noting the great interest which the argument upon it, especially from the bench, appears to have excited in Westminster Hall, and the enthusiasm with which Lord Coke regards it in his report. He seems quite elevated with conscious satisfaction and professional pride when he considers how eminently the judges had distinguished themselves; and speaks as one, not merely relating a very important decision in the law, but as one recording a great triumph of the science and its professors. "It was observed," he says, "that there was not in any remembrance so honourable, great, and intelligent an auditory at the hearing of the arguments of any Exchequer chamber case, as was at this case now adjudged. It appeareth that *juris prudentia legis communis Angliæ est scientia socialis et copiosa;* sociable, in that it agreeth with the principles and rules of other excellent sciences, divine and humane; copious, for that *quamvis ad ea quæ frequentius accidunt jura adaptantur;* yet in a case sc rare, and of such a quality, that loss is the assured end and practice of it, (for no alien can purchase lands but he loseth them, and *ipso facto* the king is entitled thereunto, in respect whereof a man would think few men would attempt it,) there should be such a multitude and farrago of authorities in all successions of ages, in our books and book-cases, for the deciding of a point of so rare an accident." This may serve as a specimen of the manner in which Coke's enthusiasm for the law is wont incidentally to display itself in his writings.

Although Lord Coke doubtless reckoned the account of Calvin's case his masterpiece as a reporter, deeming the argument itself the first sample of juridical learning and ingenuity, there are many of his cases in every respect far more worthy of commendation. If one were to be selected for the subtlety of the argument, and indeed the importance of the principles to the law, it perhaps would be that of Shelly; nevertheless, this too is disfigured by very puerile matter. For instance, when to prove that the date of the use must be referred to the recovery suffered, and not to the execution of the use, reference is made to the case of a man while insane giving himself a deadly wound, and afterwards dying while in his senses, which is by many authorities shown not to make him *felo de se;* a thing so self-evident that we are left in doubt, whether most to admire the serious foolery of those who could gravely discuss and decide it, or of those who could cite it for a purpose so foreign. Perhaps, however, upon the whole, Chudleigh's case may be taken as the best example of legal acuteness in those who argued it. Although not above twenty years before the case of the *Postnati*, it should seem that the taste of the bar had been much infected with the growing pedantry of the times during that interval.

If, indeed, we merely look to the merits of the *Reports*, it is not to any of the great cases, the renowned names, that we should resort. Beside those which have been cited, Corbet's and Mildmay's, Taltarum's, Mary Portington's, Clue's, Albany's, are all more or less open to the charge of prolixity, though very much less liable to it than the more celebrated ones of Shelly and Calvin. But the less pretending ones, which shortly give the resolutions of the court upon certain questions, and with little or no argument beyond what is necessary to explain the decision and its grounds, afford by far the best specimen of the learned reporter's talents for abstracting and recording. Indeed, the vast number of points resolved in these cases, and the generality with which they declare the law independent of peculiar facts, and unincumbered of those circumstances denominated by Lord Eldon *specialties*, after the language of the Scottish bar, present a most remarkable contrast to the decisions of modern times, wherein it is oftentimes hardly possible to arrive at a rule through the maze of details and qualifications that beset the course of the judgment.

It must not, however, be supposed that every short notice of a case in the Reports is free from learned lumber and extravagance. The case of Swans is little enough in bulk, and trifling enough in import, yet is it sufficiently chequered with nonsense, hardly exceeded by the *case of Mares* in Scriblerus's Reports. "The truth of the matter was that the Lord Strye had certain swans which were cocks, and Sir J. Charlton certain swans which were hens, and they had cignets between them; and for these cignets the owners did join in one action; for by the law the cignets do belong to both owners in common equally, *sc.* to the owner of the cock and the owner of the hen, and the cignets shall be divided betwixt them. And the law thereof is formed on a reason in nature, for the cock swan is an emblem or representative of an affectionate and true husband to his wife above all other fowls; for the cock swan holdeth himself to one female only, and for this cause nature hath conferred on him a gift beyond all others; that is to die so joyfully, that he sings sweetly when he dies; upon which the Poet saith

Dulcia defecta, &c. &c.

And therefore this case of the swan doth differ from the case of kine and other brute beasts."—*Vide* 7 *Hen.* 4. 9.

But though all Lord Coke's writings are more or less disfigured by such far-fetched and inappropriate arguments as these, it is not to be supposed that he was altogether incapable of reasoning philosophically. It certainly must be allowed that it is not often instances occur in his works of enlarged and comprehensive views, such as the great mind of Bacon delighted to indulge in; but they are sometimes to be met with. His sound and humane remarks on capital punishment, at the close of his third Institute, merit attention, whether we regard the man or the age. "Wofull experience," he says, "has shown the inefficacy of frequent and often punishment to prevent offences. It is a certain rule that those offences are often committed that are often punished; for the frequency of the punishment makes it so familiar as it is not feared." In the margin we then have "*Sta, perlege, plora,*" and in the text he continues thus: "What a lamentable case it is to see so many Christian men and women strangled on that cursed tree of the gallows; insomuch as if in a large field a man might see together all the Christians, that but in one year throughout England come to that untimely and ignominious death, if there were any spark of grace or charity in him, it would make his heart to bleed for pity and compassion." He then lays down the rules of "preventing justice," and at the head of these he places "*the good education of youth.*" Another is the granting pardons very rarely; and the third, the execution of good laws, though this he deems inferior to education.

Having now adverted to the most conspicuous faults and peculiarities which equally pervade all Coke's writings, it will be proper to give some account of his different works. The first in the order of time was the first part of his Reports, which was published in 1600, while he was attorney-general to Elizabeth. It is entitled "Reports of Sir Edward Coke, Knight, her majesty's attorney-general,* of divers resolutions and judgments given with great deliberation by the reverend judges and sages of the law, of cases and matters in law which were never resolved or adjudged before: and the reasons and causes of the said resolutions and judgments, during the most happy reign of the most illustrious and renowned queen Elizabeth, the fountaine of all justice, and the life of the law." To this report, ten more parts were added during his lifetime, the last in 1615, while he was chief justice of the King's Bench under James I; and after his death two supplementary books of them were published. These, however, not having been revised by the author himself, are not held in such high estimation as those which made their appearance during his lifetime. It has been already stated that on the disgrace of Sir Edward Coke, he was enjoined by the king to pass the summer vacation in correcting his Reports; "wherein," as James affirmed, "there were many dangerous conceits of his own uttered for law, to the prejudice of his majesty's crown, parliament, and subjects." After three months' deliberation, Coke gave in a list of such errors as he had detected; but as they were for the most part merely verbal inaccuracies, such as could in nowise support the charge intended to be brought against him, five special cases were selected by the king's order for that purpose. Sir Edward, however, answered all the objections that could be made against them in such a manner, as to satisfy all who understood the points in dispute; and, indeed, it appears that his legal adversaries, whatever might be their personal enmity towards him, or their deference to the commands of the king, were ashamed of the task imposed on them. Lord Chancellor Ellesmere, in particular, whose temperate conduct throughout the whole of the proceeding was highly creditable to him, was exceedingly anxious to be excused from it. "All that I have done in this," he wrote, "hath been by your majesty's commandment and direction, in presence of all your learned council, and by the special assistance and advice of your attorney and solicitor. I know obedience is better than sacrifice; for otherwise I would have been an humble suitor to your majesty to have been spared in all service concerning the lord chief justice." Nevertheless, though the charge was dropped for the time, it was renewed after Coke's alliance with Buckingham, while Bacon was lord keeper. But as Sir Edward openly demanded that the matter might be investigated by the twelve judges, and that they might certify at the same time what cases he had published "for the maintenance of the royal prerogative and benefit, for the safety and increase of the revenues of the church, and for the quieting of men's inheritances, and the general good of the commonwealth," his enemies thought it most prudent to avoid the inquiry altogether

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* This, it will be remarked, is not quite a correct designation, since he was not knighted till after the accession of James I.

Bacon himself has said: "Had it not been for Sir Edward Coke's Reports, (which, though they may have errors, and some peremptory and extrajudicial decisions more than are warranted, yet they contain infinite good decisions and rulings of cases,) the law by this time has been almost like a ship without ballast; for that the cases of modern experience are fled from those that are adjudged and ruled in former time."

In 1614, Sir Edward Coke published his "Booke of Entries," and his first Institute, or Commentary on Littleton appeared in 1628. His other works were not published till after his death. They consist of his "Treatise of Bail and Mainprise," (1637;) his "Complete Copyholder," (1640;) the second, third, and fourth parts of his Institutes, (1642, 1644;) and his "Reading on the Statute of Fines, 27th Ed. I." (1662.)

The first Institute of Sir Edward Coke is a running commentary on a short treatise of tenures written by Littleton, who was a judge of the Common Pleas in the reign of Edward IV. The merit of the original work has ever been warmly acknowledged by English lawyers. Lord Guildford made it a point never to let a year pass without reading it through. Coke himself calls it "the ornament of the common law, the most perfect and absolute work that ever was written in any human science;" and if his testimony be rejected as partial or exaggerated, no one will refuse to acknowledge that Sir William Jones has not gone too far in attributing to Littleton, whom he styles the English lawyer's great master, "luminous method, apposite examples, and a clear, manly style, in which nothing is redundant, nothing deficient." The commentary cannot boast of the same qualities. Strictness of method was not indeed very compatible with the nature of such a work; but the constant digressions of the annotator, of which some few examples have already been given, are multiplied to an extent that must deprive the commentary of all claim to that systematic arrangement, and severe concision, which ought to be considered indispensable in every elementary treatise. The fact is, as Blackstone has well observed, that Coke's Institutes have very little of the institutional method to warrant such a title, and that this commentary, though a rich mine of valuable common law learning, is particularly remarkable for its deficiency in method. Coke himself says, "I have termed them Institutes, because my desire is they should institute and instruct the studious, and guide him in a ready way to the knowledge of the national laws of England. This work (speaking of the Commentary on Littleton) we have called the first part of the Institute, for two causes: first, for that our author is the first book that our student taketh in hand: secondly, for that there are some other parts of Institutes not yet published, *viz.* the second part, being a commentary upon the statute of *Magna Charta*, Westminster I., and other old statutes The third part treateth of criminal causes and pleas of the crown: which three parts we have, by the goodness of Almighty God, already finished. The fourth part we have purposed to be of the jurisdiction of courts: but hereof we have only collected some materials towards the raising of so great and honourable a building. We have, by the goodness and assistance of Almighty God, brought this twelfth work to an end: in the eleven books of our Reports, we have related the opinions and judgments of others; but herein we have set down our own." This description of the four Institutes may suffice. It has already been said, that the three last are held in less estimation than the Commentary on Littleton, which is partly on account of their being posthumous works, and partly because the subjects of which they treat are generally speaking more obsolete. The law of real property which forms the subject of the first Institute, though it has undergone some considerable changes since the abolition of the feudal tenures in the reign of Charles II, still remains in many respects the same as it stood in the time of Coke; and his commentary is even now looked upon as one of the most copious and authentic sources of information on the subject. The eighteenth edition of this work was published in 1823, being the sixth which has appeared within the period of thirty years; a convincing proof of the value attached to it by modern lawyers. It may also be considered a testimony of the respect which is borne for Sir Edward Coke and his works, that his Reports, instead of being distinguished from other works of the same nature by the addition of the author's name, are invariably styled *The* Reports. Indeed, the astonishing acuteness of his mind, his immense stores of legal learning, and his unwearied industry, peculiarly qualified him to go through the arduous task he imposed on himself, in undertaking the various works which have given him a lasting reputation. Had he lived a century later, it is more than probable that the faults with which his writings are disfigured would have been corrected by the style and the spirit of a more polished age; but even with all his imperfections, he can never cease to be regarded, in every point of view, as one of the most illustrious of the numerous celebrated characters that figure in the annals of the English jurisprudence.

The Manuscripts of Lord Coke are in the possession of his descendant, Mr. Coke, of Norfolk, whom we have already mentioned as his representative through the female issue of Lord Leicester, the male heir of the chief justice.

At this gentleman's princely mansion of Holkham, is one of the finest collections, or, indeed, libraries of manuscripts anywhere preserved; certainly the finest in any private individual's possession. It partly consists of the chief justice's papers; the rest, and the bulk of it, was collected by that accomplished nobleman who built the mansion, the last male heir of the great lawyer. He had spent many years abroad, where his taste was improved and his general education perfected. He collected a vast number of the most valuable manuscripts. Of these the exquisitely illuminated missals, and other writings of a similar description, which would from their perfect beauty and great rarity bear the highest price in the market, are certainly by far the least precious in the eyes of literary men. Many of the finest *codices* of the Greek, Latin, and old Italian classics are to be found in this superb collection. Among others are no less than thirteen of Livy, a favourite author of Lord Leicester, whom he had made some progress in editing, when he learnt that Drakenborchius, the well known German critic, had proceeded further in the same task, and generously handed over to him the treasures of his library. The excellent edition of that commentator makes constant reference to the Holkham manuscripts, under the name of *MSS. Lovelliana,* from the title of Lovell; Lord Leicester not having then been promoted to the earldom. Mr. Coke, with a becoming respect for the valuable collection of his ancestors, was desirous to have the manuscripts unfolded, bound, and arranged, both with a view to their preservation and to the facility of consulting them. They had lain for half a century neglected, and in part verging towards decay, when he engaged his valued friend, William Roscoe, to undertake the labour so congenial to his taste and habits, of securing these treasures from the ravages of time. From the great number of the manuscripts, the state in which many of them were, and the distance of Mr. Roscoe's residence, this was necessarily a work of time. After above ten years employed on it, the task is now finished. Each work is beautifully and classically bound; and to each Mr. Roscoe has prefixed, in his own fair handwriting, a short account of the particular manuscript, with the bibliographical learning appertaining to it.

But our present purpose is with the small portion of this collection which descended from Lord Coke. A great part of it is in his own handwriting. There are, among others, the original manuscript of the Book of Entries, and of the Reports, in law French. The student may here enjoy the gratification of reading Shelly's case and Calvin's case in the reporter's own hand. But there are also unpublished works of the same illustrious lawyer and patriot. Among these a curious Statistical Account of England has long been known to antiquaries. Another work, much more valuable, if not written by Lord Coke himself, a supposition which appears to be negatived by internal evidence, especially by the manner of citing the Reports, yet seems to have been well esteemed by him, possibly composed under his direction. Having been favoured with a particular account of its contents, we may render an acceptable service to lawyers by describing them somewhat in detail.

It is a folio MS. of 225 pages, in English, entitled, "*A Treatise concerning the Nobility of England according to the Law of England.*" The following is the opening of the work, written pretty much in the style of the chief justice.

"As in man's body for the conservation of the whole, divers functions and offices of members are required, even soe in all well gouverned commonwealthes, a distincion of persons is necessary. *Nobilitas* generally signifieth, and is derived of the word *nosse*, to knowe, signifying in common phrase of speech both with the Lattines and also with us Englishmen, a generositie of blood; and therefore one said, '*Vir nobilis idem est quod notus et per omnia ora vulgatus.*' A nobleman is hee whoe is knowne and through all the tenor of his life is talked of by many men's mouthes. But especially applyed and used to express the reward of vertue in honourable measure, '*et generis claritatem.*' But my purpose at this tyme is onelie to speake of the nobilitye, and especiallye soe much of them as I find written in the bookes of the common lawes and statutes of the realme."

After some further preliminary matter, he goes through the different titles of honour severally, beginning with that of *prince*, and then passing to *duke*. Under these heads there is much learning upon the dutchies of Cornwall and Lancaster, and the earldom of Chester. Under the head of *earl*, and between that and *viscount*, he enters largely into the law regarding nobles, and specially the subject of *scandalum magnatum*. In the course of this discussion he breaks forth into a vehement invective against libels.

"There is another foule puddle that arriseth from the same corrupt quagmire, and distilleth out of a beastelinesse infected with malice and envie, but is devised and practised by another means than the former, which is by libelling, general slandering, and defaming of another; for this backbiter doeth not by wordes harme his adversary in so manifest and turbulent manner, as the hellewick monster in his fury doth, but seeming to sitt quietly in his studdy doth more deepelie punish him, and infixeth a more deadlie and incurable wound into his fame and credit than the other boysterous fellow doeth in his body, whoe in a moment threateneth to doe more than peradventure he is willing to perform, or dareth to perform in an age."

Under this head we meet with a curious note, as follows:—

"Note—that if a man doth write unto another scandalous words and reports touching a noble-man, and this letter be sealed with his seale and subscribed with his name, yet upon this letter, shewed in evidence, this noble man may recover damages in an action *de scan. mag.* whereof you may see presidents in Crompton; but if a man doe write any matter in defamation to the party himselfe that is thereby traduced, and subscribe and seale the same without other publication done by himselfe—quære."

Certainly there could now be no question in this matter; there being clearly no act of publication to the damage of the party slandered; whereas in the case first put there is plainly a complete publication against the nobleman to a third person, and consequently a manifest damage done. In discussing the application of the maxim, *Possessio fratris facit sororem esse heredem*, to titles of honour, and showing that it extends not to them, he argues etymologically on the meaning of *possessio;* "which," says he, "is no other than *pedis positio*, and can only be of things whereof there is entry." How plainly we perceive, in this as in a thousand instances of Lord Coke's undisputed writings, the tendency of the learned of those days to pass over the obvious and the true derivation, in order to get at some etymon of a fanciful and far-fetched kind, which may serve the purpose of his argument! Can any one doubt that *possedere* comes from *posse sedere?*

He next discusses the "Privileges incident to the Nobility, according to the Laws of England." Of these, trial by peers is the first; and under this head he lays it down that bishops have not this privilege, "because they cannot try, and trial is mutual;" a dictum long since overruled.

Exemption from attendance upon

the leet and tourn is the next privilege handled by him; and then the right of having chaplains. Then follows the privilege they have in equity suits, happily abridged by one of Sir Samuel Romilly's acts. This subject is closed with a discussion of the case "wherein a lord of parliament hath noe privilege."

The title of *Baron* is an important and an ample one.—The author treats it under three heads, Barony by Tenure, Barony by Writ, and Barony by Patent. Of these the first is the most curious, and being upon a chapter of the law now become nearly obsolete, it possesses peculiar interest, as containing the doctrine in acceptation among lawyers, in the time when that subject was more familiarly known. The author gives a great number of instances of Baronies by Tenure; tracing the descent or transmission of each in such a line as showed the peculiarity of the territorial holding, and giving tabular schemes of the persons taking a passed one. He then lays down certain canons respecting such honours, restricting exceedingly the powers of the owners of the territory and castle, once the descent of the barony.

Under the head of Baron by Patent, he discusses a subtle question: "If a nobleman and his heirs have for a long time been called to parliament, and be barons by tenure or by writ, and have had in regard thereof a place certain in parliament; if afterwards the same be created a baron of *that* barony, and by the same name, by letters patent; whether shall he and his heirs retain his oulde place in parliament which he had according to the former dignity; or whether should he lose his oulde place, and take a new accordinge to the tyme of his seconde onelie?"

There follows a concluding discussion on "nobilitie or lades in reputacion onelie." "Under this head we have treated, the subject of courtesy and forein ladies—noble women—the postnati of Scotland—and ladies in reputation."

It is certain that this manuscript is well worthy of the attention of the learned; and we venture to hope that Mr. Coke will permit it to be published.

Further information concerning the life of Sir Edward Coke, and the times during which he flourished, may be gathered from the following works:—

Biographia Britannica, art. *Coke*; whence a considerable part of the foregoing narrative has been extracted.

Bacon's Works; particularly vol. vii. of Mr. Basil Montagu's edition, which contains most of the letters quoted above.

State-Trials; particularly the trials of Essex and Raleigh, the proceedings connected with the powder-plot, and the murder of Sir Thomas Overbury. See also the first volume of Mr. Phillips's excellent "Collection of the most remarkable State Trials."

Fuller's Worthies.

Loyd's State Worthies.

Roger Coke's Detection of the Court and State of England.

Memorials of Affairs of State, in the Reigns of Queen Elizabeth and King James I., collected (chiefly) from the original papers of the Right Honourable Sir Ralph Winwood, Knt., sometime one of the principal Secretaries of State. (3 vols. folio, 1725.)

CABALA, *sive scrinia sacra:* mysteries of state and government in letters of illustrious persons and great ministers of state, as well foreign as domestic, in the reigns of King Henry VIII., Queen Elizabeth, King James, and King Charles. Wherein such secrets of empire, and public affairs, as were then in agitation, are clearly represented, and many remarkable passages faithfully collected. (folio.)

The Annals of King James and King Charles I., both of happy memory, containing a faithful history and impartial account of the great affairs of state, and transactions of parliaments in England, from the tenth of King James, 1612, to the eighteenth of King Charles, 1642. (folio, 1681.)

Rushworth's Historical Collections of private passages of state, weighty matters of law, remarkable proceedings in five parliaments. Beginning the sixteenth year of King James, *anno* 1618, and ending the fifth year of King Charles, *anno* 1629. (7 vols. folio, 1659.)

Among modern works, "The Life of Sir Edward Coke," by Mr. Woolrych, of Lincoln's Inn, contains many minute and curious details, drawn from the most authentic sources.

The Histories of Hume and Lingard, the Parliamentary History, and the Journals of the House of Commons may be consulted with advantage, so far as they relate to the proceedings mentioned in the text; and the first volume of Mr. Hallam's Constitutional History of England will also be found to contain much valuable information connected with the subject.

Miss Aikin's "Memoirs of the Court of King James the First," furnish a general account of most of the events that have been touched upon above.

Some curious particulars relative to the marriage of Coke's daughter are given in the first volume of the second series of Mr. D'Israeli's "Curiosities of Literature."

THE
LIFE OF LORD SOMERS.

JOHN SOMERS was born at Worcester, in an ancient house called the White Ladies, which, as its name seems to import, had formerly been part of a monastery or convent. The exact date of his birth cannot be ascertained, as the parish registers at Worcester, during the civil wars between Charles I. and his Parliament, were either lost, or so inaccurately kept as not to furnish any authentic information. It appears probable, however, from several concurring accounts, that he was born about the year 1650. Dean Swift, who was at first the flatterer, and afterwards the virulent calumniator, of Somers, says that he was sprung 'from the dregs of the people,' and attributes the reserve of his character to his consciousness of his low and base origin. It is, perhaps, scarcely worth while to refute so wretched a calumny; but as a matter of fact it should be stated that the family of Somers was respectable, though not wealthy, and had for several generations been possessed of an estate at Clifton, in the parish of Severnstoke in Gloucestershire. Admiral Sir George Somers[*]—who was deputy governor of Virginia, and in 1610 was shipwrecked on the Bermudas, and afterwards died there, leaving his name to that cluster of islands—is said by Horace Walpole[†] to have been a member of the same family. The father of Somers was an attorney in respectable practice at Worcester; in the civil wars he became a zealous Parliamentarian, and commanded a troop in Cromwell's army. The indecent outrages commonly practised in the churches by Cromwell's troopers, are reported in most of the histories of those unsettled times; and it is related of old Mr. Somers, that when attending divine service in the church of Severnstoke, he was so exasperated at the royalist doctrines delivered by the clergyman, that he fired a pistol above his head, the ball lodging in the sounding-board of the pulpit. Soon after the battle of Worcester, he resigned his commission and returned to the practice of his profession; but at the Restoration, he thought it prudent to procure a general pardon of all offences which he might have committed while serving in the republican army. He died in January 1681-2; and his monument, upon which is engraved a Latin inscription written by his son, is still to be seen in the church at Severnstoke.

Of the early education of Somers we have only a meagre and unsatisfactory account. The house called the White Ladies, in which he was born, was occupied by a Mr. Blurton, an eminent clothier of Worcester, who had married his father's sister. This lady having no son of her own, adopted young Somers from his birth, and brought him up in her own house, which he always considered as his home till he went to the university. He appears to have spent some years in the College-school at Worcester, which before his time[*] had attained a high character for classical education under the superintendence of Dr. Bright, a clergyman of great learning and eminence. At this school, Dr. Samuel Butler, the author of 'Hudibras,' and Chief Justice Vaughan[†], also received the first rudiments of their education. At a subsequent period, we find him at a private school at Walsall, in Staffordshire. He is described by a schoolfellow as being then 'a weakly boy, wearing a black cap, and never so much as looking out when the other boys were at play[‡].' He seems, indeed, to have been a remarkably reserved and 'sober-blooded boy.' At a somewhat later period, Sir Francis Winnington says of him, 'that, by the exactness of his knowledge and behaviour, he discouraged his father, and all the young men that knew him. They were afraid to be in his company[*].' In what manner his time was occupied from the period of his leaving school until he went to the university in 1675, is unknown. It has been suggested that he was employed for several years in his father's office, who designed him for his own department of the profession of the law. There is no positive evidence of this circumstance, though the conjecture is by no means improbable. It cannot, however, be doubted, that during this important period of his life he acquired those habits of regular and well-directed industry which were afterwards invaluable to him; and, by the diligent study of history and constitutional law, laid the foundation for that mass of learning and accomplishments which eventually rendered him the ornament of his profession, and of the age in which he lived. About this time he formed several connexions, which had great influence upon his subsequent success in life. The estates of the Earl of Shrewsbury were managed by Somers's father; and as that young nobleman had no convenient residence of his own in Worcestershire, he spent much of his time at Worcester, and formed an intimate friendship and familiarity with Somers. About the same time he was also fortunate enough to be favourably noticed by Sir Francis Winnington, then a distinguished practitioner at the English bar, who is stated to have been under obligations to his father for his active services in promoting his election as a member of parliament for the city of Worcester. Winnington is described by Burnet[†] as a lawyer, who had 'risen from small beginnings, and from as small a proportion of learning in his profession, in which he was rather bold and ready, than able.' It is natural to suppose that such a man, feeling his own deficiencies, would readily perceive with what advantage he might employ the talents and industry of such a young man as Somers in assisting him both in Westminster-hall and in parliament. It was probably with this intention that Sir Francis Winnington advised him to go to the university, and to prosecute his studies with a view to being called to the bar.

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[*] It appears from the Commons' Journals, that a Sir George Somers was, in 1605, a Member of Parliament for Lyme Regis in Dorsetshire: this was no doubt the same person.

[†] Catalogue of Royal and Noble Authors.

[*] Mr. Cooksey, and several other biographers of Somers, represent him as having been himself a pupil of Dr. Bright, and even as having boarded in his house; regardless of the anachronism, that Dr. Bright died in 1626, and that Somers was born in 1650.

[†] See his Life, prefixed to his Reports.

[‡] Seward's Anecdotes, vol. ii. p. 114.

In 1674, Somers was entered as a commoner of Trinity College, Oxford, being then about twenty-three years of age. The particulars of his progress through the university are not recorded; but here, as at school, his contemporaries could perceive few indications of those splendid talents which afterwards raised him to such extraordinary eminence. His college exercises, some of which are still extant, are said to have been in no respect remarkable; and he quitted the university without acquiring any academical honours beyond taking his bachelor's degree. It is probable that he came to London, from time to time, for the purpose of keeping his terms for the bar, while his permanent residence was at Oxford. The following anecdote is related in a memoir published soon after his death. 'Mr. Somers's father,' says this anonymous biographer, 'used to frequent the terms in London, and, in his way from Worcester, was wont to leave his horse at the George at Acton, where he often made mention of the hopeful son he had at the Temple. Cobbet, who kept the inn, hearing him enlarge so much in praise of his son, to compliment the old gentleman, cried, "Why won't you let us see him, sir?" The father, to oblige his merry landlord, desired the young gentleman to accompany him so far on his way home; and being come to the George, took the landlord aside, and said, "I have brought him, Cobbet, but you must not talk to him as you do to me; he will not suffer such fellows as you in his company."'

Mr. Somers was called to the bar in 1676[*], by the Society of the Middle Temple, but he continued his residence at the university for several years afterwards, and did not remove to London until the year 1682, when, upon his father's death, he succeeded to the paternal estate at Severnstoke, which was worth about 300*l.* per annum. During this period, he had the advantage of being introduced, by the Earl of Shrewsbury and Sir Francis Winnington, to the Earl of Essex, Sir William Jones, Algernon Sidney, and several other distinguished opponents of the arbitrary measures of the court. It has been observed, with much reason, 'that if it had not been for Mr. Somers's political connexions with Lord Shaftesbury, Sir William Jones, and other great leaders of the opposition to the court of king Charles II., he very probably had never attained those honours which he deserved and became so well*.' At this time he published several treatises, which sufficiently displayed to the world his familiar and accurate knowledge of constitutional history. His first acknowledged work was the report of an election case, and is entitled 'The memorable Case of Denzil Onslow, Esq., tried at the Assizes in Surrey, July 20th, 1681, touching his election at Haslemere, in Surrey.' His next performance was 'A Brief History of the Succession, collected out of the Records and the most authentic Historians.' This work was written at the time when the proposal to bring in a bill to exclude James Duke of York, afterwards James II., from the succession to the crown of England, occupied universal attention, and excited the most lively interest. Somers's political friends, the Earls of Essex and Shaftesbury in the House of Lords, and Sir Francis Winnington and Sir William Jones in the Lower House, warmly supported the bill of exclusion, in opposition to the scheme proposed by the more moderate party, and approved by the king, for a statutory limitation and restriction of the exercise of the regal functions in case the crown should descend to the Duke of York†. The object of Somers's tract was to exhibit the principles upon which the parliament of England has authority to alter, restrain, and qualify the right of succession to the crown; and he places the historical arguments in support of this proposition in a forcible and convincing light. Indeed, though it might be difficult to justify such a proposition by abstract reasoning upon the theory of the British constitution, it has been so repeatedly acted upon in several periods of our history, that even in the time of Charles II. the practice had, as Somers justly contended, to all intents and purposes, sanctioned and established the principle. An excellent tract, upon the same subject, entitled 'A just and modest Vindication of the two last Parliaments,' appeared shortly after the breaking up of the Oxford parliament in March, 1681, which has been partly ascribed to Somers: Burnet says that it was 'originally penned by Algernon Sidney, but that a new draught was made by Somers, which was corrected by Sir William Jones*.'

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[*] Seward's Anecdotes, vol. ii. p. 114.

[†] Burnet's Own Times, vol. i. p. 440.

[*] From the books at the Middle Temple, it appears that Somers was admitted to commons May 24th, 1669; called to the bar May 5th, 1676; and to the bench May 10th, 1689, (the day after his appointment as solicitor-general.)

Upon occasion of the attempt of the court party in 1681,—by the illegal examination of witnesses, by the king's counsel, in open court,—to induce a grand jury to find a true bill for high treason against the Earl of Shaftesbury, the failure of which exasperated the projectors of it beyond measure, Mr. Somers wrote his celebrated tract, entitled 'The Security of Englishmen's Lives, or the Trust, Power, and Duty of the Grand Juries of England explained.' This work was attributed by some to Sir William Jones. Bishop Burnet says, 'It passed as writ by Lord Essex, though I understood afterwards it was writ by Somers, who was much esteemed and often visited by Lord Essex, and who trusted himself to him, and who writ the best papers that came out in that time.' In later times, this work has been universally ascribed to Somers; and the fact of this treatise, as well as the 'Just and Modest Vindication,' being composed by him, seems confirmed by Lord Hardwicke's assertion, that he had seen the rough draughts of both of them in Lord Somers's handwriting amongst the manuscripts which were destroyed by fire at Lincoln's Inn in 1752.

With reference to Somers's conduct in the publication of these excellent constitutional treatises upon the passing politics of the day, Mr. Dunning, in his 'Letter on Libels, General Warrants, &c.,' makes the following just observation: 'Few men,' says he, 'know much of the nature of polity; and of them, all do not sufficiently attend to the conduct of administration to observe when slight innovations are made in the laws or in their administration: and of those who do, very few indeed have that degree of understanding which enables them to judge soundly of the consequences of such alterations with respect to their liberties in general. Again, of these, very few—not more than one, perhaps—has activity, resolution, and public spirit enough to publish his thoughts, as Mr. Somers did, concerning what was going forward, in order to alarm (like a good citizen) the rest of his fellow-subjects.'

During his residence at Oxford Somers was not inattentive to polite literature;

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* 2 Ralph, 784-6.

† Burnet's Own Times, vol. I. p. 481.

* Burnet's Own Times.

he published a translation of some of Ovid's Epistles into English verse, which, while it shows that he could never have attained so distinguished a place among poets, as he afterwards filled among lawyers and statesmen, is yet by no means a contemptible performance. His translations from Ovid, and a version of Plutarch's Life of Alcibiades, are the only published proofs of his classical studies at Oxford.

In the year 1682 he removed to London, and immediately commenced an assiduous attendance upon the courts of law, which at that time was considered as the highway of the legal profession. In 1683 he appeared as junior counsel to Sir Francis Winnington, in the defence to an important political prosecution, instituted against Pilkington and Shute, with several other persons, for a riot at the election of sheriffs for the city of London; and it is worthy of being remarked, that Mr. Holt, afterwards lord chief justice, was associated with him in that defence *. One of his biographers states, that, in the reign of James II., his practice produced 700*l.* a year. In those days this would have been a very large income for a common lawyer of five years' standing. It may reasonably be doubted whether this account of the extent of his practice at the bar is not considerably exaggerated; his name does not once appear in the Reports of that period, excepting in the case of Pilkington and Shute above alluded to; and it is clear, from the objection afterwards made to his being retained on the trial of the Seven Bishops, that he was not then distinguished by any great degree of professional eminence, though his merits as a political writer must have been generally known and appreciated. Such, however, was the character for research and industry which he had attained within a very few years from the commencement of his professional career, that, on the trial of the Seven Bishops in 1688, he was introduced as counsel into that momentous cause, at the express and peremptory recommendation of Pollexfen, one of the greatest lawyers of that day.

The transaction from which this celebrated trial arose is so generally and familiarly known, that it will be sufficient to remind the reader of the general outline of the circumstances. In April, 1687, James II. promulgated a 'Declaration for religious indulgence and toleration in England.' The real object of this declaration, though it professed to be directed to the attainment of general liberty of conscience, was to enable the king to introduce Roman catholics into offices of influence and importance in the state, from which they had been excluded by the rigorous statutes of Elizabeth and James I. For this purpose he declared that he had suspended all penal and sanguinary laws in matters of religion. It was obvious that, by this declaration, the king, in fact, assumed the power of absolutely dispensing with acts of parliament by his own authority; for the suspension of laws at the will of the crown, without any limitation of time, differs in no material respect from the actual repeal or abrogation of them. The king ordered the declaration to be publicly read in all churches on two several Sundays, during the time of divine service. The archbishop of Canterbury and six bishops presented a petition to the king, praying, in firm but respectful language, that the clergy might be excused from the performance of this obnoxious duty. The king and the partisans of the court were highly exasperated; the bishops were summoned before the privy council, and upon their refusal to make an apology or submission, an *ex officio* information was filed in the court of king's bench, charging them with publishing a seditious libel against the king and the government by the presentation of the petition. The rank of the defendants, the personal interest of the king in the question at issue, the general expectation excited by this conflict amongst all classes of the people, and, above all, the event of the prosecution, which was one of the principal means of driving James from his throne and kingdom, and of introducing the revolution, render the trial of the Seven Bishops one of the most important judicial proceedings that ever occurred in Westminster-hall. It was no trifling testimony, therefore, to the high estimation in which Somers was held by experienced judges of professional merit, that he should be expressly selected by the counsel for the defendants to bear a part in the defence. We are told that upon the first suggestion of Somers's name, 'objection was made amongst the bishops to him as too young and obscure a man; but old Pollexfen insisted upon him, and would not be himself retained without the other, representing him as the man who would take most pains, and go deepest into all that depended on precedents and records [*].' How far the leading counsel for the bishops were indebted to the industry and research of Somers for the extent of learning displayed in their admirable arguments on that occasion, cannot now be ascertained; his own speech, as reported in the State Trials, contains a summary of the constitutional reasons against the existence of a dispensing power in the king, expressed in clear and unaffected language, and applied with peculiar skill and judgment to the defence of his clients. His argument was particularly applauded by the audience; and there is no doubt that he owed his future fortune, in great measure, to the character he gained in this trial.

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* How. St. Tri. vol. ix. p. 241.

The intimate connexion of Somers with the leaders of that political party by whom the revolution was effected, and, in particular, with his early friend Lord Shrewsbury, leaves little room for doubt that he was actively employed in devising the means by which that important event was brought about. It is said by Addison [†], that 'as he was admitted into the secret and most retired thoughts and councils of his royal master King William, a great share in the plan of the protestant succession was universally ascribed to him.' Immediately upon the flight of James II., the Prince of Orange, by the advice of the temporary assembly of lords and commons, which he had convened as the most proper representation of the people in the emergency of the time, issued circular letters to the officers in the several counties, cities, and boroughs of England, to whom writs were usually sent for calling parliaments, directing them to summon a parliamentary convention. On this occasion, Mr. Somers, who had never sat in parliament, was returned as a representative by his native city of Worcester. We find him taking a conspicuous part in the long and laborious debates which took place in that assembly, respecting the settlement of the government. Upon a conference with the lords respecting the resolution, 'that James II., having withdrawn himself out of the kingdom, had *abdicated* the government, and that the throne had thereby become vacant [*],' Mr. Somers was one of the managers for the commons, and spoke at great length, and with much learning, in support of the original resolution, against the amendments proposed by the lords. This resolution having been ultimately adopted by both houses of parliament, and the Prince and Princess of Orange having been declared King and Queen of England, a committee was appointed, of which Somers was a member, 'to bring in general heads of such things as were absolutely necessary to be considered for the better securing the protestant religion, the laws of the land, and the liberties of the people.' The report of this committee, which was a most elaborate performance, having been submitted to the examination of a second committee, of which Somers was chairman, and connected with resolutions passed in the house of lords, formed the substance of the declaration of rights which was afterwards assented to by the king and queen and both houses of parliament, and thus solemnly acknowledged as the basis of the constitution.

It is impossible to ascertain with precision the particular services rendered by Somers in the accomplishment of this great measure. It appears from the Journals, that, during the sitting of the convention, there was not a single committee appointed on any subject of constitutional importance of which he was not a member. There was, perhaps, no individual in existence who was at that moment so well qualified as he was to lend important aid in conducting his country with safety through the difficulties and dangers of a change of government, and in placing the interests of the nation upon a secure and solid foundation. Fortunate was it for the people of England and their posterity that the services of a man of Somers's industry and settled principles, of his sound constitutional information, and his rational and enlightened views of the respective rights and duties of kings and subjects, were, at that critical juncture, available to his country; and that, at the instant of the occurrence of this momentous revolution, his character was sufficiently appreciated and acknowledged to render those services fully effective.

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[*] Kennett's Complete Hist., vol. iii. p. 513, note c.

[†] Freeholder.

[*] It may, perhaps, be worth while to call the attention of the reader to a curious parallel to this discussion in very early times. After King John had subjected the kingdom of England to the Pope, the barons determined that the throne was vacant, and offered the crown to Lewis of France. The transaction is thus related in Matthew Paris, p. 236:—'Rex supradictus, præter assensum magnatum suorum, regnum Angliæ Domino Papæ contulit et ecclesiæ Romanæ, ut iterum illud reciperet ab eis tenendum sub annuo tributo mille marcarum. Et si coronam Angliæ sine baronibus alicui dare non potuit, potuit tamen *dimittere* eam. Quam statim cum resignavit, Rex esse desiit, et regnum sine rege *vacavit*. Vacans itaque regnum, sine baronibus ordinari non debuit; unde barones elegerunt Dominum Ludovicum ratione uxoris suæ, cujus mater, Regina scilicet Castiliæ, tota ex omnibus fratribus et sororibus regis Angliæ vivens fuit.' [The above-named king, without the assent of his nobles, bestowed the kingdom of England upon our lord the pope and the Roman Church, in order that he might take it again from them to hold by an annual tribute of 1000 marks. And although he could not give away the crown to another without the assent of the barons, he might *lay it aside*; and, as soon as he had resigned it, he ceased to be king, and left the kingdom *vacant* and without a king;—now, the kingdom being vacant, could not be disposed of without the barons, wherefore the barons chose the Lord Lewis in right of his wife, whose mother, the Queen of Castille, was the only one remaining alive of the brothers and sisters of the king of England.]

Thus, in 1216, as well as in 1688, the throne was declared vacant by the abdication of the king; and, at both periods, relationship to the abdicated monarch determined the choice of a successor.

On the 9th of May, 1689, Somers was made solicitor-general, and received the honour of knighthood. In the warm debates which took place in parliament in the following year, on the bill for the recognition of the king and queen, and for avoiding all questions touching the acts made in the parliament assembled on the 13th of February, 1688, a doubt was suggested in the house of commons, whether the convention, not being summoned by the king's writ, had any legal sanction. Upon this occasion Somers greatly distinguished himself by the spirited and able manner in which he answered the objection. 'If,' said he, 'that convention was not a legal parliament, this is not a legal parliament, and we who are now met, and have taken the oaths prescribed by that parliament, are guilty of high treason; the laws repealed by that parliament being still in force, we must presently return to king James; and all the money collected, levied, and paid by virtue of the acts of that parliament, makes every one that was concerned in it highly criminal. Besides, if the laws of that parliament want confirmation, it is impossible for you to give it: upon the validity of the acts then done depends the authority of your's; and if those acts want confirmation, this parliament cannot confirm them[*].' 'He spoke,' says Burnet, 'with such zeal and such an ascendant of authority, that none were prepared to answer it, so that the bill passed without more opposition. This was a great service done in a very critical time, and contributed not a little to raise Somers's character[*].' In the debates which took place on the bill for the exercise of the powers of government by the queen in the king's absence, Somers also greatly distinguished himself by his profound acquaintance with precedents, and his argument on the effect of a delegation of the regal authority[†].

During the period that Sir John Somers filled the office of solicitor-general, it devolved upon him, in the absence of the attorney-general, to conduct the prosecution against Lord Preston for high treason. Lord Preston, who had been secretary of state to James II., had joined with several gentlemen in an ill-concerted and unpromising conspiracy to overthrow the government, and restore the exiled king, by the introduction of a French army and a French fleet. Notice having been given to the government, in December, 1690, that a vessel had been engaged for the purpose of carrying some unknown persons to France, a search was made at Gravesend, and three passengers were found concealed among the ballast in the quarter-hatch of a smack: one of those persons proved to be Lord Preston; a second was Ashton, who had held a place in the household of the late queen; and the third a gentleman named Elliot. On their discovery, Ashton attempted to throw some papers into the sea, which were recovered, and in them the treasonable nature of their design was clearly developed. Lord Preston was tried and convicted of high treason, at the Old Bailey, on the 17th of January following, before the lord chief-justices Holt and Pollexfen, and the lord-chief baron Sir Robert Atkyns[‡]. The report of the proceedings on this trial, which was the first state prosecution that had occurred since the revolution, is extremely interesting. The three presiding judges were individuals of the highest professional reputation, and the honour and independence of their character were so universally known and acknowledged, as to give extraordinary authority and dignity to the proceedings. To those who had witnessed the brutal coarseness, the indecent impatience, and the cruel ribaldry of Scroggs and Jefferies, in the state trials of the preceding reigns, it must have been a new and striking picture of the administration of criminal justice, to behold Lord Holt mildly and patiently explaining to the understanding of a somewhat pertinacious prisoner the legal reasons upon which the court refused him a copy of the indictment. Nor was it a less novel or less satisfactory part of the exhibition to observe, on the part of the counsel for the crown in a state prosecution, a studied abstinence from all invective or declamation against the prisoner, and a rigid adherence to an unvarnished statement of the facts in support of the charge, as they were about to be proved in evidence. More palpable cowardice and injustice can, indeed, hardly be conceived, than an attempt, by exaggerated statements or vituperation, to inflame the passions and mislead the judgment of a jury against a delinquent, who has not the assistance of counsel, and who, from his ignorance of the law, and inexperience in courts of justice, is literally brought out to fight without a weapon against an armed and practised adversary. It must be considered as a proof of the good taste of Somers, as well as of the enlightened justice of his mind, that he was the first English advocate who set the example of moderation and gentle demeanour towards the accused in the conduct of a criminal prosecution. 'I did never think,' says he, in his address to the jury in Lord Preston's case, 'that it was a part of any who were of counsel for the king in cases of this nature, to endeavour to aggravate the crime of the prisoners, by going about to put false colours upon evidence, or to give it more than its due weight, and therefore I shall be sure to forbear any thing of that nature. But I think it my duty to give some short account of the nature and course of the evidence to be produced to you, which, consisting of several kinds, it will be in some sort necessary to open it, that you may the more clearly apprehend it, and with more ease make your observations upon it.' He uses nearly the same language in other criminal prosecutions conducted by him, and on all occasions he faithfully adhered to the rule which he had laid down for himself.

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[*] Grey's Debates, vol. x. p. 50.

[*] Burnet's Own Times, vol. ii. p. 42.

[†] Grey's Debates, vol. x. p. 162.

[‡] How. St. Tri., vol. xii. p. 645.

In April, 1692, Sir Henry Pollexfen, the chief justice of the common pleas, died; and Sir George Treby being raised to his office, Somers became attorney-general, and in the month of March following was appointed Lord Keeper of the great seal. While he presided in the court of chancery as lord keeper, he delivered his celebrated judgment in the Bankers' case, which Mr. Hargrave characterizes as 'one of the most elaborate arguments ever delivered in Westminster-hall *.' It is said that Lord Somers expended several hundred pounds in collecting books and pamphlets for this argument.

Consistently with the good sense and modesty of his character, it appears that, after he received the great seal, he repeatedly declined a peerage when pressed upon him by the king, declaring that he had not a sufficient fortune to support the dignity. In a letter † to him from the Duke of Shrewsbury, dated May, 1695, the duke says, 'I had directions to have said everything I could imagine to persuade you to accept of a title, and the king is really convinced that it is for his service that you should. I beg the answer I may have may be a bill for the king's signing. As for arguments, I have used all I have already; and by your objections, you may give me leave to tell you, you are as partial and unreasonable, with too much modesty, as some are with too much ambition.' Notwithstanding this friendly remonstrance, he still declined a peerage for several years; and it was not until the year 1697, when appointed Lord Chancellor, that he was raised to the peerage, with the title of Baron Somers of Evesham. Upon this occasion the king granted him an annuity of 2100*l*., together with the manors of Reigate and Howleigh, in Surrey. The acceptance of these grants formed one of the charges upon which he was afterwards impeached by the commons.

In the following year Lord Somers succeeded Mr. Montague, afterwards Lord Halifax, as president of the Royal Society. The particular circumstances which led to this appointment are unknown; in all probability, however, his election to an office, the duties of which were entirely inconsistent with his judicial and political engagements, was intended merely as a compliment to his public character. The journals of the

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* How. St. Tri. vol. xiii. p. 8.

† Hardwicke State Papers, vol. ii. p. 437.

Royal Society state, that he was elected a fellow, a member of the council, and president on the same day (the 30th Nov. 1698), and was annually re-elected as president till the year 1703. During the five years that Lord Somers filled the chair of that institution, it appears, from the same authority, that he attended the meetings of the members only twice; no papers were written or communicated by him either while he was president, or before, or afterwards; nor is there any evidence, beyond the present of a Chinese chair to the Society, that he took the slightest interest in their proceedings. In the year 1703 the council seem to have considered that the objects of the institution would be more efficiently promoted by a scientific president, who would actively direct and superintend their transactions, than by one whose time and thoughts were necessarily absorbed by political business; and, in accordance with this rational impression, at the annual day of election under the charter,—they placed Sir Isaac Newton in the chair.

For some years after Lord Somers was in possession of the great seal, and before he was raised to the peerage, he enjoyed the fullest confidence of the king, and was of essential use to him in the difficult circumstances in which he was placed. There is, perhaps, no part of the history of England more devoid of interest than the narrative of the endless contentions between the whig and tory factions at the close of the seventeenth century: at the same time, there is no period which more clearly exhibits the utter worthlessness of faction, the inconsistencies and absurdities of party spirit, and the extent to which the real interests of the people may be neglected and injured, when rival parties are struggling for power in the administration of government. Scarcely were the principles of the revolution defined and established by the Act of Settlement, when each house of parliament became the arena of fierce contention between the whigs and tories; no occasion was too trivial for the exhibition of skirmishes discreditable to both parties, detrimental to the public service, and mortifying, almost beyond endurance, to the feelings of the king. Embarrassed and provoked by the conduct of the two factions, William repeatedly threatened to retire to Holland, and leave the government of England to the queen. He told the Duke of Hamilton, that 'he wished he were a thousand miles from England, and had never been king of it;' and declared to Lord Halifax, that 'all the difference he knew between the two parties was, that the tories would cut his throat in the morning, and the whigs in the afternoon.' In this state of affairs, the wisdom and integrity of Lord Somers became of important service, not only to the king personally, but to the general interests of the nation. Himself a whig, and zealously attached to whig principles, he contrived in some degree to moderate and restrain the impetuosity of his own party; and, by the obvious good sense of his advice, so recommended himself to the confidence of the king, that none of his ministers, with the single exception, perhaps, of Lord Sunderland, ever obtained a greater influence in his councils. Bishop Burnet says*, that, 'as Lord Somers was one of the ablest and most incorrupt judges that ever sat in chancery, so his great capacity for all affairs made the king consider him before all his ministers, and he well deserved the confidence the king expressed for him on all occasions.' His conduct on the death of Queen Mary, in 1694, in promoting a reconciliation between the king and the Princess Anne, as exhibited in the following anecdote†, shows at once the extent of his influence, and the judicious mode in which he used it:—Soon after the queen's death, the princess was prevailed upon by Lord Sunderland to write a letter to the king, condoling with him on the event, and soliciting a reconciliation. A short time after this letter had been received, and as soon as he concluded that it had produced its effect, Lord Somers, who had long regretted the unhappy dissensions in the royal family, repaired to the palace at Kensington; he found the king sitting at the end of his closet, in an agony of grief more acute than seemed consonant to his phlegmatic temper. Absorbed in reflection, William took no notice of the intrusion, till Somers broke silence by proposing to terminate the unhappy difference with the princess: the king replied, 'My lord, do what you will, I can think of no business.' To a repetition of the proposal the same answer was returned. By the agency of Somers an interview was accordingly arranged, in which the king received the princess with cordiality and demonstrations of apparent regard, informing her that the palace of St. James's should be appropriated for her future residence.

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* Burnet's Own Times, vol. ii. p. 218.

† Coxe's Life of Marlborough, vol. i. p. 58.

By his influence with the king, and the skill and discretion with which he covertly guided the movements of his own party, Lord Somers had been, for some time before his elevation to the peerage, the means of preserving the whig administration; and in 1698, after the resignation of the Earl of Sunderland, the chief power of the government rested in his hands, and those of Lord Orford and Mr. Montague. Within two years, however, from the period of his appointment as lord chancellor, he was destined to experience the force of party malignity, and the selfishness and instability of royal favour. The tories plainly perceived that there were no hopes of power for their party, unless they could succeed in destroying his popularity, and removing him not only from his office, but from the private confidence of William. To this object, therefore, the combined efforts of the faction in both houses of parliament were directed incessantly and effectually, aided by the innumerable artifices of insidious intriguers distributed about the person of the king. In a letter* to the Duke of Shrewsbury, which, though without a date, was undoubtedly written about the close of the year 1698, Lord Somers distinctly alludes to the progress which had then been made in undermining the stability of the whig ministry. 'There is nothing,' says he, 'to support the whigs, but the difficulty of the king's piecing with the other party, and the almost impossibility of finding a set of tories who will unite. So that, in the end, I conclude it will be a pieced business, which will fall asunder immediately.' The first symptom of the decline and fall of the whig administration was unquestionably the failure of the proposal for the maintenance of a standing army in 1697, and the consequent resignation of Lord Sunderland. Though holding only the insignificant office of lord chamberlain, Lord Sunderland had long acted the part of prime minister, and was universally believed to have encouraged and promoted, if he did not originally suggest, the obnoxious and unsuccessful project for a standing army. Alarmed at the national clamour, and the rapidly declining popularity of the whigs, and dreading the prospect of a parliamentary censure, which was not obscurely hinted at by the tories, he resigned his office, 'not only,' says Burnet, 'against the entreaties of his friends, but even the king's earnest desire that he would continue about him*.'

The next object of attack was the Earl of Orford, who had been for many years at the head of both the admiralty and navy departments. In the early part of 1699, he also resigned his employments, not choosing to risk the consequences of a threatened contest with the house of commons respecting his accounts as treasurer of the navy; and, in the course of the same year, Mr. Montague, foreseeing a storm arising, which he had not courage to encounter, also retired from the ministry. On the other hand, Lord Somers, who still retained a great degree of influence over the king, determined to continue at his post till he could no longer be serviceable to his country. He reprobated the conduct of his colleagues in thus deserting their party, and declared that in his opinion 'it was altogether unnecessary to surrender at discretion to the tories; that if the king would be true to his friends, they would be true to him:' and strongly urged the dissolution of the parliament, for the purpose of giving the whigs an opportunity of recovering their ascendancy in the house of commons. The king was himself favourable to a dissolution, but the great majority of his ministers dissuaded him from so bold, and, as they represented it, so dangerous a measure, and it was consequently abandoned. But though powerful in influence, and still more powerful in his acknowledged talents and integrity, Lord Somers was at this period the *only* remaining support of the tottering fabric of the whig administration: to his removal, therefore, as the last obstacle to their return to power, the strenuous efforts of the tories were now directed.

In pursuance of this design, the tory party in the house of commons, in the course of the stormy session of parliament which commenced in November, 1699, made several violent but ineffectual attacks upon the lord chancellor. The first charge brought against him was, that in the exercise of his office as superintendent of the magistracy of the country, he had improperly dismissed many gentlemen from the commission of the peace. Upon a full explanation of the circumstances, it appeared that in 1695 and 1696, when the rebellious project commonly called the Assassination Plot was discovered, a voluntary association had been formed for the support of the king and the government, which originated in the houses of parliament, and was generally entered into throughout the country: it was thought that those who refused to enter into this association were so ill-affected, or at least so little zealous for the government, that they ought not to continue justices of peace; and an order was made in council that such persons should be excluded from the commission. All that Lord Somers had done was to obey this order upon the representations of the lords-lieutenant of the different counties; and so cautious had he been to do no injustice in this respect, that he laid all these representations before the privy council, and refused to strike out a name without a special order in each particular case. This charge was proved to be so utterly groundless, that it was abandoned by those who introduced it*. The second accusation had no better foundation than the first. Great complaints having been made of certain English pirates in the West Indies, who had plundered several merchant ships, it was determined to send out a ship of war for the purpose of destroying them. But as there was no fund to bear the charge of such an expedition, the king proposed to his ministers that it should be carried on as a private undertaking, and promised to subscribe 3000*l*. on his own account. In compliance with this recommendation, Lord Somers, the Duke of Shrewsbury, the Earls of Romney, Orford, Bellamont, and several others, contributed a sufficient sum to defray the whole expense of the armament; and as the adventure was entirely supported by the private funds of individuals, the whole of the prizes which might be taken were given by letters-patent to the persons who had subscribed towards it. Burnet says†, that 'Lord Somers understood nothing of the matter, and left it wholly to the management of others: only that he thought it became the post he was in to concur in such a public service.' Unfortunately, one Captain Kidd was appointed, on the recommendation of Lord Bellamont, the governor of New York, to command the expedition, who, instead of attacking the pirates, was unprincipled enough to turn pirate himself, and having committed various acts of robbery on the high seas, was eventually captured, brought to England, and some time afterwards tried and executed for his offences. Upon this occurrence it was insinuated that the lord chancellor, and the other individuals who had subscribed towards the expedition, were engaged as partners in Kidd's piratical scheme, with full knowledge of his intentions. The enterprise was said, by some speakers in the house of commons, to be 'framed on a mere pretence of public service, but in truth for the sake of spoil; those who were too tender-conscienced to commence pirates in the first instance, feeling no repugnance to sharing among themselves that which had been unjustly taken from others.' So that an undertaking, which was not only innocent, but meritorious and patriotic, was construed, by the blindness of party prejudice, into a premeditated design for robbery and piracy. The chancellor, as a magistrate placed at the head of the highest department of justice, became the peculiar object of invective and reproach, and he was said to have 'disgraced his high station by participating in an enterprise so scandalous.' Some of the members even went so far as to visit Kidd in Newgate, for the purpose of extracting evidence; but the sturdy pirate stoutly declared, both in private, and upon his examination at the bar of the house, 'that he had never spoken to Lord Somers in his life, and that the only orders he had received were to pursue his voyage against the pirates.' A motion in the house of commons was founded upon this absurd imputation, but was rejected by a great majority. Shortly afterwards, after ordering a list of the privy council to be laid before the house, a question was moved in the house of commons, 'That an address should be made to his Majesty to remove John Lord Somers, Chancellor of England, from his presence and councils for ever.' This motion, however, was also negatived by a large majority. In reference to this motion, Matthew Prior, the celebrated wit and poet, who was then under-secretary of state to the Earl of Jersey, in a letter to the Earl of Manchester, dated

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* Hardwicke State Papers, vol. ii. p. 436.

* Burnet's Own Times, vol. ii. p. 207.

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* Burnet's Own Times, vol. ii. p. 241.

† Ibid., p. 236.

February 12th, 1700, says, 'To-morrow is the great day when we expect that my lord chancellor will be fallen upon: though God knows what crime he is guilty of, but that of being a very great man, and a wise and upright judge.' It is related, that some time afterwards, the king declared, at dinner, in the presence of several peers, respecting Kidd's affair, that 'if, by the law of England, he could be a witness, he could, of his own knowledge, justify the lords concerned in all they had done in that business.'

These vexatious proceedings in the house of commons, though they failed in their immediate object, filled the mind of the king with irritation and disgust. He renewed his impatient threat of quitting the government of a nation whom he charged with the deepest ingratitude; and though diverted from this purpose, which he never perhaps seriously entertained, he was readily induced to listen to the interested advise of the tory leaders, who promised, if intrusted with the conduct of government, to extricate him from the labyrinth in which he was involved. Artfully affecting to disparage and disbelieve the late charges against the lord chancellor in the house of commons, they represented to the king that his unpopularity in that house was alone of such fatal detriment to the public service, that it was absolutely necessary to remove him from the government. This suggestion was reported to Lord Somers by the king himself, who at the same time intimated to him that he was inclined to concur in the necessity of his giving up the great seal. Lord Somers assured the king, that he was perfectly willing to resign it, and anxious to retire from public business; but that he was so firmly convinced that those who had advised his removal had done so to serve themselves and not the government, that he was resolved, with his majesty's permission, to keep the seal in defiance of their malice; that he feared them not, and was ready to endure patiently all the trials they might put upon him, with the hope of being serviceable to his majesty.' He repeated, that 'if his majesty would adhere to his friends, they would be true to him, and that in a new parliament he had no doubt that he should be able to carry whatever points he had in view for the public welfare.' The king shook his head doubtfully, and said 'It must be so.'

" The parliament was prorogued on the 11th of April, 1700: and very soon afterwards, the king, wearied with the perpetual broils of faction, determined at all events to try the experiment of an accommodation with the tories, and inconsiderately and selfishly consented to dismiss the lord chancellor from his office. At the time when this resolution was formed, Lord Somers was confined to his house by a severe attack of illness; and on his first appearance at court after his recovery, the king informed him, that he was now convinced that it was necessary for his service that he should resign the seal, but wished him to make the resignation himself, in order that it might appear to be his own act. The chancellor declined to make a voluntary surrender of the great seal, as such a course might be supposed to indicate a fear of his enemies, or a consciousness of misconduct in his office; upon which Lord Jersey, the secretary of state, was sent to him on the 17th of April, 1700, with an express warrant, and Lord Somers delivered the seal to him without hesitation. 'Thus,' says Bishop Burnet,*, 'the Lord Somers was discharged from his great office, which he had held seven years, with a high reputation for capacity, integrity, and diligence. He was in all respects the greatest man I had ever known in that post: his being thus removed was much censured by all but those who had procured it. Our princes used not to dismiss ministers who served them well, unless they were pressed to it by a house of commons that refused to give money till they were laid aside. But here a minister, who was always vindicated by a great majority in the house of commons when he was charged there, and who had served both with fidelity and success, and was indeed censured for nothing so much as for his being too compliant with the king's humour and notions, or at least for being too soft or too feeble in representing his errors to him, was removed without a shadow of complaint against him.' It is said that, shortly before his death, the king declared that his unjust conduct towards Lord Somers at this time was the circumstance in his past life which he reflected upon with the greatest uneasiness. Much difficulty was experienced in finding a successor: the uncertainty of the duration of the new administration, together with a reluctance to succeed so great a man in an office of so much responsibility, deterred persons of rank and eminence in the profession from aspiring to the ephemeral dignity of the seal. The office was successively offered to Lord Chief Justice Holt, and Sir Thomas Trevor, the attorney-general, who both declined to receive it; the great seal was then placed for a short time in commission, and was ultimately bestowed upon Sir Nathan Wright, one of the king's serjeants, a man but very indifferently qualified for the office to which he was preferred.

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* Burnet's Own Times, vol. ii. p. 242.

On his return from Holland in October, 1700, the king completed his arrangements for the tory administration; and the new ministers, judging that their interest would be strengthened upon a re-election, immediately dissolved the parliament. The new parliament assembled on the 10th of February, 1701; and it immediately appeared, upon occasion of the election of a speaker, that the expectations formed by the ministry, of a great predominance of the tory interest, were verified. Early in the session of parliament, the celebrated Partition Treaties gave occasion to much angry debate in both houses, but especially in the commons. Although Lord Somers's conduct with respect to these treaties seems not to have been entirely irreproachable, it became the subject of much misrepresentation; and he was assailed with a virulence of invective and abuse, quite disproportionate to his imputed error. It appears that in the spring of 1698, before the king's departure for Holland, a proposal was made to him by the agent of the French government, for a treaty to arrange the partition of some of the territories belonging to the crown of Spain, upon the expected death of Charles II. This partition was to be made in certain defined proportions between the electoral Prince of Bavaria, the Dauphin of France, and the Archduke Charles, the second son of the emperor. The king entertained these proposals favourably, and the negotiation proceeded almost entirely between the French agent and his majesty, and without the formal interference of ministers*. In August of the same year the king wrote to Lord Somers from Loo, explaining to him the proposed treaty, desiring his opinion upon the several articles, and commanding him to forward, in the most secret manner, to him in Holland, a formal commission in blank under the great seal, appointing persons to treat with the commissioners of the French government. Lord Somers, after communicating with Lord Orford, the Duke of Shrewsbury, and Mr. Montague, as he had been authorized to do, transmitted to the king their joint opinion, which suggested several objections to the proposed treaty, and forwarded at the same time the required commission. Lord Somers undoubtedly disapproved of the partition treaties: and it was his duty, as a responsible minister of the crown, to have expressed his opinion to the king explicitly when the opportunity was offered to him; but this was the 'head and front of his offending.' He had neither proposed nor advised the measure: and the treaty was afterwards negotiated abroad, and finally signed by plenipotentiaries of France and England without any further communication with him.

Though the power of the house of commons at this period was increased, its character as a deliberative assembly was much depreciated: 'very little of gravity, order, or common decency,' says Burnet, 'appeared among them:' but the acrimony of the debates in the house on the Partition Treaty is almost unexampled in the history of parliament. One of the members termed it 'a felonious treaty:' which, considering that the king was universally known to be, from the beginning, personally engaged much more than his ministers in the transaction, was perhaps the most indecent expression ever used in the unbounded licence of parliamentary debate. The king himself was so offended and exasperated by it, that he passionately declared, that had his rank permitted, he would have demanded personal satisfaction for the insult. All the papers relating to the negotiation were scrutinized with malignant activity; and the character and conduct of every individual in the slightest degree connected with the transaction were attacked with sarcasm, ridicule, and the most unmeasured abuse. In the midst of this raging commotion of faction Lord Somers desired to be heard in the house of commons in his own defence. His application being granted, he was introduced within the bar, and addressed the house in his usual calm and dignified style of reasoning, declaring fully and perspicuously the motives of his conduct. He admitted 'that the king had asked the advice of his confidential servants upon this occasion; and that his majesty had even informed him, that if he and his other ministers thought that a treaty ought not to be made upon such a project, that the whole matter must be let fall, for he could not bring the French to better terms.' He further told the house, 'that when he received the king's letter from Holland, with an order to send over the necessary powers, he conceived that he should be assuming too much upon himself if he caused any delay in the progress of so important a treaty, considering the precarious state of the health of the king of Spain; for if the Spanish king died before the treaty was completed, he would not have been justified in delaying the transmission of the powers, as the king's letter amounted in fact to a warrant: it was not indeed an actual and formal warrant, but in its effect a substantial and positive command; that, at all events, he did not think it became him to endanger the public interest by insisting on a point of form, at a very critical time, and when the greatest despatch was requisite; that, nevertheless, he had written his own opinion very fully to his majesty, objecting to several particulars in the treaty, and proposing other articles which he thought were for the interest of England; that he thought himself bound, by the duty of his office, to put the great seal to the treaty when it was concluded; and that, in the whole course of the transaction, he had offered his best advice to his sovereign as a privy councillor, and as chancellor had executed his office according to his conception of his duty.' This address, delivered with much eloquence, and a simplicity and earnestness of manner which were peculiar to Lord Somers, produced so deep an impression upon the house, that it was believed by Walpole, who was present*, that had the question upon his impeachment been put immediately, it would have been negatived by a large majority. After he had withdrawn, however, a warm debate ensued, in the course of which the favourable disposition produced by Lord Somers's statement was entirely effaced: it ended in a resolution, carried by a majority of only ten, 'that John, Lord Somers, by advising his majesty to conclude the Treaty of Partition, whereby large territories of the Spanish monarchy were to be delivered up to France, was guilty of a high crime and misdemeanour.' Similar resolutions were passed against Lord Portland, Lord Orford, and Mr. Montague, the latter of whom had been lately raised to the peerage with the title of Marquess of Halifax; and all of them were impeached at the bar of the house of lords.

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* The mode in which this negotiation was personally conducted between the king, the Earl of Portland, who was then ambassador in France, and Count Tallard, the French agent, is fully developed in Williams's correspondence with Secretary Heinsius in the Hardwicke State Papers, vol. ii.

Greater unfairness and partiality can hardly be conceived than were exhibited by the house of commons in the institution of these proceedings. The Earl of Jersey, a tory, was beyond all comparison more active than Lord Somers in the negotiation of the Partition Treaties; he had in fact signed the treaties, as plenipotentiary, with the Earl of Portland: yet, though he held an office in the government, and was near the king's person, he was not impeached, nor was there any motion made for his removal. Sir Joseph Williamson, likewise a tory, and a privy councillor, who had signed the treaty as a plenipotentiary, was also passed over, and remained unimpeached in his office. The commons, however, were fully aware that they could not secure a majority in the house of lords to forward their partial and factious schemes, and, in all probability, never intended to proceed seriously with the impeachment. They therefore passed a resolution of censure, immediately after the votes of impeachment, in the form of a motion, for an address to his majesty 'to remove the Lords Somers, Orford, Portland, and Halifax, from his presence and councils for ever.' The flagrant inconsistency of the commons in urging the king to punish before trial, and to inflict, without a hearing, a heavy censure upon persons for conduct which they had themselves placed in a course of judicial investigation, was so obvious to the lords, that they immediately voted an address to the king, praying 'that the lords impeached at the bar of their house might not have any censure passed upon them till they were tried upon the impeachments, and judgment was given according to the usage of parliament and the law of the land.'

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* Coxe's Life of Sir Robert Walpole, vol. i. p. 25.

The commons, having carried their resolution for a censure upon the impeached lords, which they were satisfied would have the effect of excluding them from the public service, became indifferent to the progress of the impeachment. Several weeks elapsed during which not a single step was taken, and it was not until a message had been sent from the lords to remind them of the necessity of proceeding, that the formal articles of impeachment were prepared and presented. The articles against Lord Somers principally charged him with having affixed the great seal to the blank commission for the Partition Treaty sent to the king in Holland, and afterwards to the treaty itself; with having shared in the projected piracy of Captain Kidd; and with having received various grants from the crown for his own personal emolument. To each of these articles he answered promptly and fully. To the two first he replied the facts of each case as above related; and in answer to the third he admitted that the king had been pleased to make certain grants to him, but denied that they had been made in consequence of any solicitation on his part. After many frivolous delays and repeated disputes between the two houses, a day was peremptorily fixed for the trial of the impeachment. The lords went down to Westminster Hall in the form usual on such occasions; the articles were first read, and then the answers to them; but the commons not appearing to prosecute their articles, the lords returned to their own house, and, after a long and warm debate, resolved, by a considerable majority, to acquit Lord Somers of the charges, and to dismiss the impeachment.

The conduct of the lords in the course of these proceedings received the general approbation of the nation, whilst the violence and folly of the tories in the house of commons were universally condemned by all thinking people, and the character of that party was much lowered in public estimation. The eyes of the king, too, were now opened to his error in having changed his ministry at so critical a period. He found, to his infinite disquietude, that, instead of enabling him to manage the commons as they had promised, the tory leaders had rendered them far more intractable and imperious than before; and that instead of sincerely endeavouring to promote peace abroad and quiet government at home, each man was pursuing his own paltry objects of private passion or revenge. The Earl of Rochester was at the head of the tory administration, and the king is said to have repeatedly declared that the year in which that nobleman directed his councils was the most uneasy of his life, and to have resolved to disengage himself quickly from him, and never to return to him any more[*].

The whole of the summer of 1701, the king spent at Loo, in Holland, in a very feeble state of health. At the beginning of the month of September, he wrote from thence to Lord Sunderland, expressing his disposition to change his ministry, and earnestly desiring his advice generally upon the state of his affairs in England[*]. Lord Sunderland, in his reply[†], which is a most remarkable document, advises the king, in decided terms, to dismiss his tory ministry, 'who,' he says, 'grow more hated every day, and more exposed.' After reminding the king of the difficulties into which he had been brought by the tories, and the failure of all the hopes they had held out to him, Lord Sunderland concludes this singular letter in the following manner: 'But at last what can the king do? Let him come into England as soon as he can, and immediately send for my Lord Somers. He is the life, the soul, and the spirit of his party, and can answer for it; not like the present ministers, who have no credit with theirs, any further than they can persuade the king to be undone. When his majesty speaks to my Lord Somers, he ought to do it openly and freely, and ask him plainly what he and his friends can do, and will do, and what they expect, and the methods they would propose. By this the king will come to make a judgment of his affairs, and he may be sure that my Lord Somers will desire nothing for himself, or any of the impeached lords, but will take as much care not to perplex the king's business as can be desired; and if he can do nothing his majesty shall like, he will remain still zealous and affectionate to his person and government. This is thought to be the best way the king can take, and, perhaps, the only means of being able to resolve with reason. It should be considered that, by the present ministry, the tories have infinitely lost their credit, and the others have in proportion gained. It is a melancholy thing, that the king, who has more understanding than any body who comes near him, is imposed on by mountebanks, or by such as he himself knows hate both his person and government!'

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[*] Burnet's Own Time, vol. ii. p. 280.

[†] Hardwicke State Papers, vol. ii. p. 442.

[‡] Ibid. p. 444.

In conformity with the advice of Lord Sunderland, the king immediately wrote to Lord Somers, desiring him to communicate unreservedly to him through Lord Galway his sentiments upon public affairs, and assuring him of the continuance of his friendship*. Lord Somers, upon this communication, drew up certain heads of arguments for a recurrence to a whig administration, and the immediate dissolution of the parliament, which were afterwards communicated to the king. The affairs of the nation were, at this precise point of time, in an extremely critical situation. On the 16th September, 1701, while this negotiation was proceeding between the king and Lords Sunderland and Somers, the abdicated monarch, King James II., died at St. Germain's. The death of an exile, who, for several years, had extinguished all ambition of regaining the throne of England in the austerities and extravagances of religious fanaticism, would have been entirely insignificant, had it not derived importance from the events which ensued, and the peculiar crisis of the affairs of England. Immediately upon his death, the prince his son was proclaimed by the officers of his household king of England, with the title of James III.; and a few days afterwards the French king, in opposition to the advice of his ministers, and in violation of the arrangements of the treaty of Ryswick, by which it was expressly stipulated that he should not disturb the king of Great Britain in the peaceable possession of his dominions, gave orders that he should be publicly recognized in that capacity. On receiving intelligence of the event, the king of England despatched a courier to the king of Sweden, who had guaranteed the treaty of Ryswick, to complain of this obvious infraction; and he sent an express to the Earl of Manchester, then his ambassador at the French court, commanding him to return to England without taking his audience of leave. Though it does not seem to have been intended by the king of France to have this effect, the acknowledgment of the title of the abdicated house resembled a declaration of perpetual war; at all events, it furnished William with abundant reasons for joining the other powers of Europe in resisting the grasping ambition of Louis. The hostile effect which this injudicious act produced upon the feeling of the people of England was instantaneous and universal. William returned to England in November, and upon his arrival addresses from all parts of the country poured in upon him, expressive of approbation of his conduct in having at once assumed a hostile attitude, of loyalty and devotion to his title, and of a determination to support him in maintaining his just rights against all foreign dictation or invasion. Such was the state of feeling in the nation at large upon the king's return, in which, however, those who occupied the great offices of government by no means cordially participated. Upon this the king at once determined to adopt the advice of Lord Somers, by calling a new parliament, and changing the ministry at the earliest practicable moment. With this intention a proclamation was issued immediately after his arrival, dissolving the parliament and summoning the new parliament to meet on the 30th of December, 1701. In the mean time various changes were made in the ministry, to the disadvantage of the tory party; it is even said that the seals were at that time offered to Lord Somers, and upon his hesitating, and suggesting the possibility of circumstances arising which might bring back the opposite party into power, the king passionately exclaimed, 'Never, never, never!'*. Lord Somers, however, did not at this time become a member of the government, though he was on the point of being restored to office. There is no doubt that he composed William's last address to his parliament, which Burnet calls 'the best speech that he or, perhaps, any other prince ever made to his people,' Lord Hardwicke having seen the draft of it in Lord Somers's handwriting amongst the manuscripts destroyed by fire at Lincoln's-inn. The simple eloquence of this celebrated speech, and the sagacity with which every line of it is weighed for the purpose of diverting the stream of popular excitement from factious objects, and permanently directing it in an useful channel, amply justify the general applause with which it was received by contemporaries, and the praise bestowed upon it by historians. Its effect upon the nation was astonishing. Both houses of parliament presented animated and affectionate addresses to the king, and the commons immediately voted ample supplies with a ~~degree~~ of zeal and unanimity which were without example since the revolution. 'The whole nation,' says Mr. Burke*, in allusion to this general enthusiasm, 'split before into an hundred adverse factions, with a king at its head evidently declining to his tomb, —the whole nation, lords, commons, and people, proceeded as one body, informed by one soul.' In the mean time the arrangements for the formation of a whig administration were proceeding; but before they could be completed, the death of the king, in March, 1702, put an end to the project, and on the accession of Queen Anne, a sort of mixed administration was formed, compounded of the elements of both parties, but in which the tory interests prevailed, and from which Lord Somers and the most eminent leaders of the whigs were wholly excluded.

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* Hardwicke State Papers, vol. ii. p. 443.

* 2 Ralfe, 1005.

The state of parties for several years after the accession of Queen Anne prevented Lord Somers from taking any managing part in the government. He spent much of his time at this period in retirement at his seat near Cheshunt, in Hertfordshire, and employed his leisure in antiquarian pursuits, and general literature and science. 'He was very learned,' says Burnet, 'in his own profession, with a great deal more learning in other professions—in divinity, philosophy, and history.' He is said to have possessed an extensive collection of medals and other historical curiosities, and to have expended large sums of money in the purchase of rare books, prints, and pamphlets.

But though he was excluded from the administration, Lord Somers was a regular and punctual attendant upon his duties in the house of lords. His name is rarely absent from the list of peers who are recorded daily on the journals as present in their places; and he appears, by the same authority, to have been a member of almost all the lords' committees appointed at this period. He took a prominent part, during the first parliament of Queen Anne, in the year 1702-3, in the debates upon the bill against occasional conformity. By this bill it was proposed to enact that persons who had only *occasionally* conformed to the church of England, by taking the sacrament and tests, required by the statute of Charles II., previously to entering upon offices of trust, and had afterwards frequented any meeting of dissenters, should be disabled from holding their employments, and be subjected to a penalty of 100*l.*, and 5*l.* for every day in which they acted in their offices, after having been at such a meeting. This bill, after much discussion, passed the house of commons by a considerable majority, but the measure met with a warm, and eventually a successful opposition in the lords. The majority of the bishops, including Burnet, who made a powerful speech against it, objected to the bill on a conscientious persuasion that the principles upon which it proceeded were unjust to the dissenters, and would have the effect of promoting injurious hostility between that body and the church of England. In consequence of this opposition various alterations were suggested, to which the commons refused to agree, and demanded a free conference. Lord Somers was one of the managers for the lords at this conference, and supported the proposed amendments. After much altercation each house adhered to its opinion, and the bill was consequently lost. It was, however, revived in the following session, with some modifications, and again passed the house of commons, but in the house of lords it was rejected at the second reading by a majority of twelve voices; Lord Somers, on this occasion, expressing a strong opinion against the policy and justice of the measure, and voting in the negative. Swift says, that Lord Somers told him that, 'if he had the least suspicion that the rejecting this bill would hurt the church, or do a kindness to the dissenters, he would lose his right hand rather than speak against it.'

In the following year, 1704, the popular project of appropriating the revenue of first-fruits and tenths to the increase of the incomes of the poorer clergy was proposed by the queen to parliament, and though the name of Lord Somers does not expressly appear, there is reason to believe that he was mainly instrumental in carrying it to a successful issue. This branch of the revenue was derived from an impost paid in catholic times to the pope upon each admission to a benefice, which, upon the Reformation, was vested in Henry VIII., and from that time formed a part of the income of the crown. It was not, however, collected as other parts of the royal revenue, but was received from the clergy by the archbishops and bishops, and set apart as a fund from which pensions to court favourites were paid. At the time it was given up by Queen Anne, Lord Sunderland was in the enjoyment of a pension of 2000*l.* a-year for two lives, charged upon this fund. Bishop Burnet had long directed his attention to this means of increasing the incomes of the poorer clergy, and had frequently, though unsuccessfully, urged upon King William the measure now adopted by the queen; and it appears from the following letter to Burnet, written during the progress of the arrangement of the change of ministry immediately before the king's death, that he found in Lord Somers an active coadjutor in his enlightened and benevolent scheme:—

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* Letters on a Regicide Peace.

'Nov. 22, 1701.

'My Lord,—I acknowledge the honour of your lordship's letter of the 17th, with great thankfulness; I wish it may be in my power to contribute to the excellent design you propose. No man will enter into it more willingly, nor shall labour in it more heartily. The point of the first-fruits and tenths is what I have proposed several times, with much earnestness, but without success. When I have the happiness of seeing your lordship, we shall, I hope, discourse at large upon the whole subject. In the mean time allow me to assure you, that I am, with great and sincere respect, my lord,

'Your Lordship's most obedient
'Humble Servant,
'Somers.'

Soon after the meeting of the new parliament, called in October, 1705, a motion was made in the house of lords, by Lord Haversham, whom the Duchess of Marlborough calls a 'great speechmaker and publisher of his speeches,' for an address to the queen, praying her majesty to invite the Princess Sophia, the presumptive heir to the crown, to reside in England. Though this proposition was in fact a mere manœuvre of faction, and intended by the tories to drive their opponents into the dilemma of offending the queen by acquiescing in it, or of injuring their reputation with the princess and the electorate family by opposing it, arguments of great plausibility were used in its support. It was urged that there were no means so effectual to secure the peaceable succession to the throne, as by having the successor on the spot to assume and maintain his right. In answer to this, the whig speakers in the house of lords, among whom was Lord Somers, represented the inconveniences and jealousies which must arise from the establishment of rival courts in the same country; suggesting also the policy and propriety of retaining the successor in some degree in a state of dependence on the reigning sovereign. In the end, the Earl of Wharton brought in a bill empowering a council of regency to act upon the contingency of a demise of the crown, until the arrival of a successor, which was received with much applause by the people generally; and though a factious opposition was raised to it by the tories, it passed through both houses of parliament without a division. The Electorate family were fully satisfied by the introduction of another bill by the same party, which naturalized all the descendants of the Princess Sophia, wherever born; and the Earl of Halifax being despatched to Hanover with these acts after they had passed, Lord Somers and several other whig peers sent letters to the Electoral Court, in vindication of their conduct, which entirely secured an amicable understanding. The princess said that 'she was charmed to see the respect and affection shown by the parliament to her majesty;' and Lord Somers, with much dexterity, suggested, that 'if the invitation had been assented to with reluctancy on the part of the queen, it might have given rise to unkindness which in the end might have proved very fatal.' Thus, the scheme of the tories to embroil their opponents with the queen or the electress totally failed; and on the contrary, the queen, who was present during the debates, was so offended at the disrespect to her person displayed in the speeches of some of the tory lords, that from that moment (according to the representation of the Duchess of Marlborough) she began to indicate a disposition to become really reconciled with the whigs. She had previously to this period introduced several persons into the ministry who were notoriously attached to that party; and it was about this time that she commissioned Lord Godolphin to assure the leaders of the whigs that she intended to place herself and her affairs in such hands as they should approve.

A cry of danger to the established church having been raised in the course of the debates in parliament on Lord Haversham's motion, Lord Halifax moved in the house of peers that a day should be appointed to inquire into the grounds of this pretended danger. Upon this motion a warm debate ensued, in which Lord Somers delivered a manly and impressive speech, censuring the authors of such reports as actuated solely by the design of embroiling the nation at home, and impeding the judicious policy of the government abroad. He concluded his speech by an animated eulogium upon the conduct of the existing administration *. The debate terminated in a resolution, carried by a majority of 61 to 30 voices, 'that the church of England, as by law established, which was rescued from the extremest danger by King William III. of glorious memory, is now in a most safe and flourishing condition, and that those who spread reports to the contrary are enemies of the queen and her government.' This resolution was also adopted by the commons, and the effect of it was incorporated in an address to the queen, who declared her satisfaction at finding both houses ready to concur with her in putting a stop to these false and malicious reports.

Lord Somers had, since his retirement from office, applied himself with his characteristic industry to the arrangement of the details of a measure intended to remedy several gross defects and abuses in the practical machinery of the courts of chancery and common law; and towards the end of this session of parliament he introduced into the house of lords a 'Bill for the amendment of the Law and better advancement of Justice.' The particulars of this valuable enactment are of too technical a nature to be interesting, or even perhaps intelligible, to unprofessional readers. Its general object is to prevent a delay or failure of justice in consequence of formal objections; and in comparison with the previous condition of our courts it must be acknowledged that it introduced most important improvements into the municipal law of England by cutting off, or applying to useful purposes, a vast number of excrescences which previously disfigured the administration of justice. It appears, however, that Lord Somers experienced in no small degree the difficulties and embarrassments which have impeded those who, in more modern times, have employed themselves in legal reforms. The measure, as at first introduced, was of much more extensive operation; it readily passed the house of lords, and received the approbation of the Lord Keeper and the Judges; but in passing through the commons, it was found, says Burnet*, 'that the interest of under officers, clerks, and attorneys, whose gains were to be lessened by the bill, was more considered than the interest of the nation itself; several clauses, how beneficial soever to the subject, which touched on their profit, were left out by the commons.' This statute is particularly mentioned in terms of approbation in the queen's speech at the conclusion of the session in March, 1706†.

In the course of this session of parliament the way was opened to the final arrangement of the union with Scotland, a measure of infinite importance to both countries, which had been long considered and discussed by the most enlightened writers and statesmen, and was at length conducted to its successful completion principally by the learning, activity, and wisdom of Lord Somers.

About a century before the time of which we are speaking, the accidental union of the crowns of England and Scotland under James I. naturally suggested the notion of a permanent consolidation of the two countries. It seems, indeed, extraordinary that a measure of this kind should not have been effected, or at least attempted, at an earlier period in the case of countries so peculiarly pointed out by nature for union; for, to use the words of Bacon, 'There be no mountains nor races of hills, there be no seas or great rivers, there is no diversity of tongue or language that hath invited or provoked this ancient separation and divorce*.' The value of a complete political union to countries naturally united by climate, language, contiguity of situation, and consequent identity of interest with respect to foreign enemies, is admirably illustrated by Bacon in his several Memorials on this subject; and his practical arguments upon the increase of power produced by union in such circumstances amply justify his expression to the king, that 'England, Scotland, and Ireland, well united, were such a trefoil as no other prince weareth in his crown†.' In conformity with this opinion, a proposal for an union with Scotland was laid by James I., before his first and second parliaments, and commissioners were appointed to arrange its details; but though urged forward with the utmost zeal and even impatience by the king, and earnestly and actively promoted by the powerful intellect of that great man whose writings had suggested and matured the scheme, and who says, 'that the labour of the commission rested most upon his hand,' the project of an incorporating union entirely failed, and nothing resulted from the attempt beyond the abolition of the hostile laws previously subsisting between the two kingdoms.

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* Coxe's Memoirs of Marlborough.

* Own Times, vol. ii. p. 439.

† Chandler's Commons' Debates, vol. iii. p. 473.

The practicability of the union had also been frequently debated since the reign of James I. It was much discussed in the Scotch Parliament or Convention assembled at Edinburgh, upon the arrival of the Prince of Orange; and at that time commissioners were appointed in Scotland to arrange the terms of a treaty. Various obstacles impeded the progress of the measure during the whole reign of William; but the last public act of his life was to send a message‡ to his parliament, recommending to them, in the most earnest manner, to proceed with the treaty. The reader will remember that at this time Lord Somers was in the most intimate confidence of the king. William died eight days after this message was delivered; and his successor, in her first speech to the same parliament, strongly urges the subject upon their attention. An act was accordingly passed without delay, appointing commissioners to conduct the treaty on the part of England.

The state of parties in both countries, however, prevented the further progress of the measure at that period; but in March, 1705, an act of parliament was passed, entitled 'An act for the effectual securing of the kingdom of England from the apparent dangers that may arise from several acts lately passed in the parliament of Scotland*.' By one of the provisions of this act, the queen was enabled to appoint commissioners for England to treat with commissioners for Scotland, for an union between the two kingdoms. The proceedings of these commissioners were directed by the statute to be reduced into writing and submitted to the queen and the parliament of each kingdom, to whom the entire consideration of them, and the allowing or disallowing the whole or any part thereof, were expressly reserved. In her speech at the opening of the ensuing parliament in October, 1705, the queen again referred to the subject, stating, that commissioners had lately been appointed by the Scottish Parliament, and that she intended in a short time to cause commissions on the part of England to be made out. Accordingly, commissioners were soon afterwards appointed by the queen, and the name of Lord Somers appeared in the commission amongst those of the wisest statesmen of the time, though he was not then a member of the administration. The delegates for both countries assembled at Whitehall on the 15th of April, 1706, and commenced their deliberations with the solemnity which the magnitude of the occasion deserved. The Scottish commissioners, and, indeed, a considerable party in Scotland, were strongly impressed in favour of a federal union similar to that which then existed in the United Provinces and in the cantons of Switzerland. The English commissioners, on the other hand, insisted upon a substantial incorporation, by which the national interests should be consolidated and identified into one kingdom, and all distinctions between the two countries, with respect to representation and government, should be entirely and for ever abolished. This was the main point of discussion between the two parties; but in the end, the Scotch commissioners agreed to the proposal of an incorporating union. On the 23d of July, 1706, the articles being fully arranged and completed, with entire unanimity on both sides, were formally presented to the queen, who expressed her acquiescence and satisfaction, declaring, that 'she should always look upon it as a particular happiness, if a project, which promised so great a security and advantage to both kingdoms, could be accomplished in her reign *.'

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* 'Brief Discourse of the Happy Union of the Kingdoms,' &c.

† Letter to the King on Presenting his Discourse touching the Plantation of Ireland.

‡ Chandler's Commons' Debates, vol. iii. p. 189.

* 3 and 4 Anne, cap. vii.

The stipulations of this treaty are well known; and as the part taken by Lord Somers in the discussion of them by the commissioners is not recorded, it would be quite unnecessary to repeat them in this memoir.

Generally speaking, the articles seem to be highly favourable to Scotland in all substantial respects, though in some points they were thought to derogate from the national dignity and independence. In the sharing of the public burdens assigned to Scotland, that country had a decided advantage; less than the fortieth part of the public taxes were to be levied in Scotland; and yet, contrary to the maxim generally received, that in framing a government representation should be in proportion to taxation, the Scotch were offered nearly one-eleventh part of the legislature. On the other hand, the Scotch peerage, as an independent body, were deprived of their privileges as lords of parliament, the whole community being in future to be represented in the English parliament by sixteen elective peers and forty-five members in the house of commons. The debates in the parliament of Scotland upon the ratification of this treaty, displayed exertions of eloquence and argument rarely excelled in any deliberative assembly. The speeches of the celebrated Fletcher of Saltoun, and Lord Belhaven, against the union, and that of Seaton of Pittmedden in favour of it, are the most remarkable. At length, however, by the great personal address of the Duke of Queensberry, the opposition of some of the most influential objectors to the measure was removed, and the treaty, as originally framed, and without any material alterations, received the solemn sanction of the Scottish parliament.

The English parliament met on the 3d of December, 1706; and on the 28th of January following, the queen announced in the house of lords the ratification of the treaty of union by the parliament of Scotland. Very shortly afterwards, a bill was introduced into the house of commons, ratifying the same on the part of England, which passed through the commons with great facility and very little discussion; so much so, that Burnet says 'it was thought they interposed not delay and consideration enough, suitable to the importance of so great a transaction." The debates in the house of lords, in which Lord Somers acted the most conspicuous part, in the defence of the union, were longer and more solemn; but all the articles were carried by large majorities, and on the 6th of March, 1706, the bill received the royal assent.

Thus was this great work, of the accomplishment of which most of the wisest politicians of that day despaired, and which none expected to see effected without a lingering negotiation of many years, commenced and completed within the compass of a single year. In her speech to the lords and commons before the passing of the bill, the queen expresses herself in the following terms:—'I consider this union as a matter of the greatest importance to the wealth, strength, and safety of the whole island; and, at the same time, as a work of so much difficulty and nicety in its own nature, that till now all attempts which have been made towards it in the course of above a hundred years have proved ineffectual; and therefore I make no doubt but it will be remembered and spoken of hereafter to the honour of those who have been instrumental in bringing it to such a happy conclusion.'

In truth, the incorporation of two sovereign kingdoms, not by force or hostile aggression on the part of either, but by the express consent of both, founded upon the conviction of mutual advantage, was without a precedent in the history of the world; but the success of the experiment, now practically confirmed by the experience of more than a century, depended almost entirely upon the skilful arrangement of the details. The merit of projecting the scheme has been generally ascribed to Lord Somers *; but it was in the laborious discussion of particular articles, upon which the political and

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* Chandler, vol. iii. p. 479.

* Burnet's Own Times, vol. ii. p. 458.

commercial interests of the two nations appeared to conflict,—the patient and skilful management of objections passionately suggested by national pride and prejudice, that his high authority, his calm temper, and lucid reasoning, were most conspicuously useful. If the magnitude of the interests at stake, the weight and number of the difficulties interposed by faction in both countries, and the eminent and acknowledged success of the measure are duly considered, it will be readily admitted that there are few statesmen in the history of this country whose claims to the respect and gratitude of posterity are better founded than those of Lord Somers, for his services in the accomplishment of the union with Scotland.

In the ensuing session of parliament, a bill passed the house of commons for abolishing the privy council of Scotland. It was proposed, in the house of lords, to give it a continuance for several months after the passing of the bill. This proposition was powerfully and successfully opposed by Lord Somers. The heads of his speech on this occasion are still in existence *, being preserved amongst the few fragments which were saved from the fire in Lincoln's Inn, already alluded to. His arguments in this speech against a separate council for Scotland are extremely forcible and curious, and are particularly interesting in the present day, when the question of the policy of a distinct government for Ireland is strangely brought under discussion. He declares that 'he is heartily desirous of making the union entire and complete, but that it cannot be perfect while two political administrations subsist. The true argument for the union was the great danger to both kingdoms from a divided state. The advantage of Scotland is to have the same easy access to the prince as England, to be under the immediate personal care of the prince, and not to owe their protection and countenance to any subordinate institution.' 'This,' he says, 'was my argument for the union; and now if a distinct administration continue, the marks of distinction will continue; and Scotland, having now no parliament to resort to, will be in a worse state than before. I wish North Britain as happy as England; I meant it should be so in the union; and I will always do what lies in my little power that it shall be really so. I should think the true way to make the union well relished in Scotland is to let that country see plainly that England means no otherwise than fairly by them, and desires they should be in the very same circumstances they are themselves. In the union of Poland and Lithuania, by keeping up their distinct great offices of state and their distinct diets, though there be one general diet for their united country, their former manners of division are continued, and have occasioned perpetual dissensions and distractions in that imperfectly and unskilfully united country, so that they are much more unhappy than if they had still remained divided.' Upon the suggestion that it was only proposed to continue the Scotch privy council a short time, he asks, 'If it be a good thing, why is it not to be continued? If it be the desire of Scotland, why show it them only to be taken away? If they are afraid of the council, why should they be terrified with it, when it is not meant to continue?' The whole tenor of the reasoning in this admirable speech is equally clear and convincing; and the inconvenience and oppression occasioned in the reign of Queen Elizabeth, and earlier periods of our history, by the existence of distinct councils for various districts in England, with powers delegated by the crown, but beyond the personal control of the sovereign, are illustrated in the most ingenious and masterly manner.

In the early part of the year 1708, a change took place in the character of the ministry, by the resignation of Harley and the appointment of Mr. Boyle in his place, as secretary of state. Lord Somers had often announced his resolution never to accept any office of state while Harley continued in administration; but upon the removal of that obstacle, it became an object of the first importance to the whigs to press him into the royal service. Nor was this object opposed by the leaders in the cabinet; for the mildness and candour of his character, and his steady attachment to the principles of the revolution, had won the respect even of his rivals, and he was personally esteemed by both Lord Marlborough and Lord Godolphin. But the proposition of placing him in the administration was strenuously resisted by the queen. In a letter to Lord Marlborough * she de-

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* Hardwicke State Papers, vol. ii. p. 473.

* Coxe's Life of Marlborough, vol. ii. p. 423.

clares that 'it would be utter destruction to her to bring Lord Somers into her service, and was what she never could consent to.'

Besides political prejudices, it is probable that the queen had a strong domestic reason for her objection. Prince George of Denmark, the husband of the queen, though he interfered little in public business, had always been attached to the tory party, and had long entertained and expressed a particular aversion to Lord Somers. This antipathy might be probably traced to a circumstance which occurred in 1703, shortly after the queen's accession to the throne. To a bill for enabling the queen to settle a revenue upon the prince, in case he should survive her majesty, it was proposed to add an express exemption of the prince from the operation of the clause in the act of succession which incapacitated foreigners from being members of the privy council, from sitting in parliament, and from holding offices under the crown. This proposition was urged upon the attention of parliament by the queen, and gave rise to much warm discussion in the house of lords; and though it was ultimately adopted by a majority, Lord Somers, who took a prominent part in the debate, with several other peers, signed a protest in the journals against the decision of the house*.

It was probably from a desire to avoid offence to the prince, that the queen, who had expressed in decided terms her sense of the obligations of the country to Lord Somers for his services in promoting the union, had objected to introduce him into the administration. The death of the prince in October, 1708, removed this objection; and, shortly afterwards, Lord Somers was advanced to the post of president of the council, though still with reluctance and hesitation on the part of the queen. 'The great capacity and inflexible integrity of this lord,' says Burnet†, 'would have made his promotion to this post very acceptable to the whigs at any juncture, but it was most particularly so at this time, for it was expected that propositions for a general peace would be quickly made; and so they reckoned that the management of that upon which not only the safety of the nation, but of all Europe depended, was in sure hands when he was set at the head of the councils, upon whom neither ill practices nor false colours were like to make any impression. Thus the minds of all those who were truly zealous for the present constitution were much quieted by this promotion.'

But the sanguine hopes of the whig party were not realized by the event. Whether it was to be attributed to the declining health of Lord Somers, which, at this period, in a great degree incapacitated him for business, or to the embarrassing intrigues of Harley, afterwards Lord Oxford, with the queen, or the want of harmony and consistency which prevailed among the members of the administration, is uncertain; but there is no doubt that the government, during the two years that it remained under the direction of the whigs, exhibited but few marks of vigour or discretion. The treaty for a general peace proved entirely abortive; the war became decidedly unpopular in England; the general confidence of the whigs in their party wavered; and the public funds, which even in those times had begun to be the measure of the degree of public confidence in the government, fell rapidly and alarmingly.

In this unpromising state of things, 'the foolish and violent prosecution' of Dr. Sacheverel, as it is justly termed by Lord Bolingbroke, if it did not immediately induce the queen to change the ministry, at all events furnished her with a plausible and popular pretext for the dismissal of the whigs. Though Lord Somers was present at the trial, and gave his vote against Dr. Sacheverel, Dean Swift declares that he had heard him profess that his opinion was against this ill-judged impeachment, and that he foresaw it would end in the ruin of his party. The proceedings against Sacheverel were brought to a conclusion at the end of March, 1710, and immediately afterwards the parliament was prorogued. In the course of the ensuing summer a sudden and total change of ministry took place; and Lord Somers, finding that the queen had withdrawn her confidence from him and treated him with coldness and reserve, retired from his office of lord president of the council, and was succeeded by the Earl of Rochester.

During the whole of the long session of parliament after his retirement from office, it appears from the journals that he attended constantly upon his duty in the house of lords, being rarely absent from his place, and much employed in committees and other active parliamentary business. He was present during the debates respecting the Earl of Peterborough's conduct in Spain, in January, 1711, in the course of which reflections being cast upon the Lords Galway and Tyrawley, and a vote of censure being attempted against them, those noblemen presented a petition praying for time to answer the charges before the lords came to any determination. This was resisted by the ministers as an improper interference with the debates of the lords; but Lord Somers declared, with some indignation, 'that the petitions were neither improper nor given in at an improper time; that it would be too late for the petitioners to apply to the lords after they were come to a resolution; that he hoped it would never be found in the book of that house, that when the lords were going to proceed to a censure, they refused to hear those that were to be affected by it; that the Lords Galway and Tyrawley had a right to be heard and clear the matters of fact as subjects of Great Britain; and that it was but natural justice that men in danger of being censured should have time to justify themselves*.' The petitions were, however, rejected by the house; and a vote of censure was afterwards passed upon Lords Galway and Tyrawley; but a strong protest was entered upon the journals against both these resolutions, signed by thirty-six peers, amongst whom were Lord Somers, the Duke of Marlborough, and Lord Cowper, the late chancellor. Lord Somers also signed protests against the resolution of the lords approving of the Earl of Peterborough's conduct in Spain, and against several resolutions passed in the course of the same session censuring the measures of the late ministry respecting the prosecution of the war†.

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* Lords' Journals, Jan. 19, 1702-3. Burnet's Own Times, vol. ii. p. 339.

† Own Times, vol. ii. p. 516.

At the commencement of the next session of parliament, in December, 1711, there were some rumours of a change of ministry. Swift says ‡ that 'Bolingbroke and he were both of opinion that the queen was false,' and mentions a report that the whole matter was arranged between her and the whigs, and that Lord Somers was to be treasurer.' In a few days, however, these apprehensions were removed, and Lord Oxford expressly assures Swift that 'all would be well, and that he should fear nothing.'

In the early part of the year 1712, Lord Somers suffered severely from illness, which disabled him from appearing in the house of lords for a considerable portion of the session of parliament. At this point, perhaps, his political life may be considered as closed; for though he afterwards attended in parliament for several sessions, and was present upon most occasions of importance or unusual interest, he never again took a prominent part in the debates. He was present at the debate on the Earl of Findlater's motion for repealing the union with Scotland, in June, 1713, and voted with the small majority by whom that proposition was negatived. In 1714 the celebrated Schism Act was passed, by which all schoolmasters and instructors of youth were required to subscribe an acknowledgment before the ordinary, that they conformed to the liturgy of the church of England, under pain of imprisonment for three months; and upon being convicted of teaching without such subscription, were made liable to penalties and imprisonment. Against this unjust and unnecessary measure—which Lord Wharton declared to be 'more like a decree of Julian the apostate, than a law enacted by a protestant parliament,'—a protest was entered on the journals, and signed, amongst other peers, by Lord Somers. The reasons attached to this protest contain an excellent summary of the arguments against all religious persecution, and a perspicuous statement of the danger of irritating the dissenters against the church of England, and of promoting religious animosities in the critical state in which the Protestant succession was then placed. Fortunately, the death of the queen on the 1st of August, 1714, the very day on which the schism bill was to take effect, prevented its being brought into practical operation. On the accession of George I., a total change of ministry took place: the state of Lord Somers's health disabled him from accepting any official employment, but he took his seat in the cabinet council as a member of the new administration.

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* Chandler's Lords' Debates, vol. ii. p. 309.

† See Lords' Journals, Jan. and Feb. 1710-11.

‡ Swift's Journal, Dec. 9, 1711.

party, it was now Lord Somers's fate, not only to find himself once more restored to office, but to witness the downfall of that intriguing statesman whose insidious schemes had undermined the whig ministry in 1710, and to whom, both personally and politically, he had declared perpetual and uncompromising hostility. But notwithstanding his dislike to Lord Oxford, there is reason to believe that Lord Somers, and also Lord Halifax and Lord Sunderland, were opposed to the violent and impetuous prosecutions which were instituted at this time against those who had supported or favoured the Pretender's title, and warmly advised the king to more moderate measures. When he left Hanover, on the death of queen Anne, the king, whose disposition was by no means implacable or severe, had determined indeed to restore the whigs to power, but resolved not to proceed harshly against any party who acknowledged and quietly submitted to his government. In consequence, however, of the joint importunity of some of the allies, and a portion of the whigs, who assured him that severity was absolutely necessary for his own safety, he was at length persuaded to adopt a different course. It is related by Lord Bolingbroke, that 'when Lord Townshend came triumphantly to acquaint Lord Somers with all the measures of proscription and of persecution which the ministers intended, and to which the king had at last consented, the old peer asked him "what he meant," and shed tears on the foresight of measures like to those of the Roman triumvirate *.'

The Earl of Oxford had been removed from his office of lord treasurer a few days before the death of queen Anne; and in the first parliament of her successor, he was impeached, with Lord Bolingbroke, at the bar of the house of lords, of high treason. Though become extremely feeble, Lord Somers appeared in the house of lords on every occasion when a step was taken in the proceedings against Lords Oxford and Bolingbroke, and upon the delivery of Lord Oxford's answers to the articles of impeachment in September, 1715, he was appointed a member of a committee to search for precedents as to the manner of proceeding. In the ensuing session, he again appeared in the house of lords on occasion of the impeachment of the Earl of Derwentwater, and the other misguided persons who had taken up arms in Scotland in favour of the pretender's title. Lord Somers appears to have taken a peculiar interest in the fate of these unfortunate noblemen; and the last occasion of his appearance in public life was on the 27th of January, 1716, when the preliminaries and forms for passing judgment on Lord Derwentwater were reported to the house of lords, and finally arranged. When the sentence was actually passed, he was absent from the house*.

Of the manner in which the few remaining months of Lord Somers's life were spent after his final disappearance from public business, very imperfect and unsatisfactory accounts have descended to us. There is no doubt, however, that the concluding period of his existence was darkened by severe illness and a considerable degree of mental alienation. Repeated attacks of paralysis had destroyed his bodily health, and had so impaired the faculties of his mind that he became wholly incapable of business. At intervals, however, when the pressure of disease was partially suspended, he appears to have recurred with strong interest to passing events which involved those principles of rational liberty to the support of which his life had been devoted. At the present moment, when the question of repealing the Septennial Bill is the subject of controversy, it is interesting, and may be useful, to record the dying opinion of this distinguished statesman, the oracle of the revolution, and the constant friend of popular freedom, upon the merits of that celebrated measure. The decisive division upon the Septennial Bill took place on the 16th of April; 1716, and after that event had happened, Dr. Freind, the celebrated physician, called on Lord Townshend, and informed him that Lord Somers was at that moment restored to the full possession of his faculties by a fit of the gout, which suspended the effect of his paralytic complaint. Townshend immediately waited on Lord Somers, who, as soon as he came into the room, embraced him, and said, 'I have just heard of the work in which you are engaged, and congratulate you upon it; I never approved the Triennial Bill, and always considered it in effeet the reverse of what it was intended.

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* European Magazine, vol. xix. p. 427.

* Lords' Journals, January, 1715-16.

'You have my hearty approbation in this business, and I think it will be the greatest support possible to the liberty of the country*.' Within a day or two after this conversation with Lord Townshend, a fresh paralytic seizure reduced him to a state of total imbecility, from which, on the 26th of April, 1716, he was happily released by death. He was buried at Mims, in Hertfordshire, at which place a monument with a short inscription was erected by his sister, Lady Jekyll.

Lord Somers was never married. It is said that while he held the office of solicitor-general, he paid his addresses to a daughter of Sir John Bawdon, an alderman of London, and that the negotiation went so far as the arrangements for the settlements, but was broken off in consequence of the exorbitant demands of the friends of the young lady. Upon his death, his property descended to his two sisters, one of whom was married to Sir Joseph Jekyll, the master of the rolls, and the other to Charles Cocks, Esq., of Worcester, from whom the present Lord Somers is descended.

The scarcity of information respecting the personal history of Lord Somers renders it impossible, at the present day, to do full justice to his biography. It is believed that few original letters or papers, illustrative of the private and domestic habits of this eminent statesman, are now in existence. Several letters from him to Mr. Locke, in the years 1689 and 1690, have been published by the late Lord King in his Life of that great man; but they have no peculiar interest beyond the evidence they contain that, at the period to which they refer, Lord Somers and Mr. Locke were on terms of friendly and familiar intercourse. After the death of Lord Somers, his manuscripts, which filled upwards of sixty volumes in quarto, came into the possession of Lord Chancellor Hardwicke, who had married his niece. This valuable collection had been deposited in the chambers of the Honourable Charles Yorke, in Lincoln's-inn, and were there destroyed by an accidental fire in 1752. Amongst the numerous historical papers swept away by this fatal accident, were doubtless many documents relating to Lord Somers of a private nature, and of deep interest; and though some specimens of the collection, which are sufficiently valuable to enhance our regret at the loss of the rest, have been published by Lord Hardwicke, they do not relate to his personal history and character. Several years ago, great expectations were raised by the announcement of an Essay on the Life and Character of Lord Somers, by Mr. Cooksey, a gentleman who was allied by marriage to the Somers family, and who, it was supposed, might be in possession of original information on the subject. But these reasonable expectations were entirely disappointed. Amongst many inaccuracies and false traditions and speculations, Mr. Cooksey's work contained not a single true statement respecting Lord Somers which was not known and published long before. On the other hand, Mr. Cooksey, professing to 'wipe away the only blemish and imperfection charged upon his ancestor,' (by which he means the contemptible sneers of Swift respecting the meanness of his origin,) with a singular inconsistency, drags before the public an imputation of licentiousness, which, if true, might well have been buried in oblivion, but which is decidedly untrue to anything like the extent represented in the 'Essay.'

It is much to be lamented, too, that the accounts of this great man by contemporaneous writers, partake, in general, too much of the zeal of party to be of any value as delineations of his character. In this respect the undiscriminating praise of Addison is fully as objectionable as the almost gross scurrility of Swift. The following account, taken from a letter written, by an unknown contemporary*, is just and temperate. 'His application and capacity were equally great and uncommon. At his first going to school, he never gave himself any of the diversions of children of his age, for at noon the book was never out of his hand. To the last years of his life a few hours of sleep sufficed; at waking a reader attended, and entertained him with the most valuable authors. Such management raised him to the highest eminency in his own profession, and gave him a superiority in all kind of useful knowledge and learning. Natural strength and clearness of understanding, thus improved, was the distinguishing peculiarity which appeared in all his performances. Everything was easy and correct, pure and proper. He was unwearied in the application of all his ability for the service of his country. As a writer, he greatly assisted the cause of liberty in its utmost peril. As an advocate, a judge, a senator, and a minister, the highest praises and the most grateful remembrance are due to his merits.

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* Coxe's Life of Sir Robert Walpole, vol. i. p. 76.

* Seward's Anecdotes, vol. ii. p. 114. Additional MSS. in the British Museum, No. 4223.

'He was invariable and uniform in the pursuit of right paths. As he well understood, he was equally firm in adhering to the interest of his country while in its service, and when in a private station. To this uniformity the calumnies and reproaches of his enemies may be truly ascribed. They envied him his superiority, and as their wishes and designs were far from being engaged for the real welfare of society, a man so upright and able naturally became the object of their hatred.'

Such is the representation of Lord Somers by one who lived in his time, and who seems to have derived the principal part of his information from the son of Sir Francis Winnington, his early and intimate friend. In judging of his intellectual character at the present day by his various published writings and his forensic and parliamentary speeches, the reader cannot fail to be impressed with the singular clearness of perception which formed the distinguishing feature of his understanding. This quality of mind is seen in the closeness and accuracy of his own reasoning, and the instant readiness, resembling intuition, with which he detected the sophistry or false argument of his opponents. His mind appeared to discern at a single glance all the elements of a proposition, however complicated, and to perceive with equal distinctness and rapidity all the bearings of the arguments by which it might be maintained. The clearness of his perception rendered his expression proportionately lucid, his language being always apposite and intelligible, and the arrangement of his materials singularly perspicuous. In the happy art of selecting the essential points in an intricate subject, and levelling them to the comprehension of ordinary minds, he has never, perhaps, been excelled by any writer or speaker in any age. As a public speaker, he had the rare advantage of a calm and steady temper. 'He had,' says Burnet, 'an extraordinary temper; he was fair and gentle, perhaps to a fault.' In consequence of this enviable disposition he never, even in the warmth of debate, lost the control of his powerful faculties, and the operations of his intellect were always carried on without the interruption of passion.

His judicial reputation was entirely unspotted. During the seven years that he held the seals not a single imputation of corruption or partiality was ever hazarded against him. When the party who promoted his impeachment in 1701 ransacked every transaction of his court to find a plausible ground of accusation, they could discover absolutely nothing, and were compelled to found their prosecution upon charges independent of his office of chancellor, and so utterly incredible and absurd that the house of commons could not venture to appear in their support. In his judicial character, too, the placidness of his temper gave him great advantages. Burnet says, that 'he had all the patience and softness, as well as the justice and equity becoming a great judge*.' Evelyn, in his Diary, though he admits that Lord Somers was 'a most excellent lawyer, very learned in all polite literature, a superior pen, and master of a handsome style and easy conversation,' insinuates that, while he was lord chancellor, he 'made too much haste to be as rich as his predecessor.' There is no evidence in support of this slander, nor is it alluded to by any other writer; on the contrary, Swift, writing at a time when he was not likely to omit any plausible imputation on Lord Somers's character, expressly says † that 'avarice he had none.'

Of the political character of Lord Somers, it has been usual for writers of his own party to speak in terms of unmeasured panegyric. A careful perusal of the parliamentary history of the reign of Queen Anne would probably suggest some qualification of our praise. But perfect patriotism, pure and undefiled by all admixture with self-interest and faction, was not the virtue of the times he lived in. Of all views of personal aggrandizement or private interest, Lord Somers is unanimously acquitted; but in order to attain the grand objects of his ambition, which were intimately connected with the general good of the nation, it was necessary that he should maintain his ascendency over individuals whose intentions were far less disinterested than his own; and if the means by which he moved the engine of party were not always the most direct and unexceptionable, the severity of our censure may, perhaps, be mitigated by the reflection, that the object to which it was applied was the successful accomplishment of such measures as the security of a free constitution and the harmonious union of two kingdoms. 'The conduct of a minister,' says Lord Bolingbroke*, 'who proposes to himself a great and noble object, and who pursues it steadily, may seem for awhile a riddle to the world, especially in a government like ours, where numbers of men, different in their characters and different in their interests, are at all times to be managed; where public affairs are to be exposed to more accidents and greater hazards than in other countries, and where, by consequence, he who is at the head of business will find himself often distracted by measures which have no relation to his purpose, and obliged to bend himself to things which are in some degree contrary to his main design. The ocean that environs us is an emblem of our government, and the pilot and the minister are in similar circumstances. It seldom happens that either of them can steer a direct course, and they both arrive at their port by means which frequently seem to carry them from it. But as the work advances, the conduct of him who leads it on with real abilities clears up, the appearing inconsistencies are reconciled, and when it is once consummated, the whole shows itself so uniform, so plain, and so natural, that every dabbler in politics will be apt to think he could have done the same.'

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* The earlier editions of Garth's Dispensary contain this couplet—

'Somers doth sick'ning Equity restore,
And helpless orphans now need weep no more.'

† History of the Four Last Years of the Reign of Queen Anne.

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* Letter to Sir William Windham.

LIFE OF WILLIAM CAXTON,

WITH

AN ACCOUNT OF THE INVENTION OF PRINTING, AND OF THE MODES AND MATERIALS USED FOR TRANSMITTING KNOWLEDGE BEFORE THAT TOOK PLACE.

The ease, which we now find in providing, and dispersing, what number of copies of books we please, by the opportunity of the press, makes us apt to imagine, without considering the matter, that the publication of books was the same easy affair in all former times as in the present. But the case was quite different. For, when there were no books in the world, but what were written out by hand, with great labour and expense, the method of publishing them was necessarily very slow, and the price very dear; so that the rich only and curious would be disposed or able to purchase them; and to such also it was often difficult to procure them, or to know even where they were to be bought.—*Middleton's Free Enquiry*, p. 198

CHAPTER I.

Introductory—Different kinds of Biography—Kind to which that of Caxton belongs—Principal object in selecting it—Nature and arrangement of the subjects necessary to be touched upon in order to attain that object.

THE lives of some men supply scanty materials for private and personal biography; whereas the materials that connect them with the advancement of the human race in knowledge, civilization, and happiness, are, in no common degree, rich and interesting. Such is the case with the life of William Caxton. Very few of the events of his life are known; and it is highly probable that, if we had them in minute detail, they would have presented nothing very curious or very instructive,—nothing that would have justified us in selecting his life, on account either of the insight it afforded into the formation of the human mind and character, or of the impressive and practical lesson it taught, that, in moral conduct, as certainly as in the material world, like causes will always produce like effects. Such lives as give this insight, and teach by powerful and repeated examples this most important, but too often neglected truth, are certainly of the highest utility as well as interest: they give biography a just claim to be ranked above all other studies, in so far as it teaches, most emphatically, that close attention, and persevering and zealous industry, are absolutely necessary for the acquisition of knowledge; and that these qualities, united with probity, are equally necessary to our success in the world, and to our usefulness and respectability in society.

The biography of those men, however, whose lives have contributed to the improvement of the human race, even though they have displayed no superior talent, ought, by no means, to be neglected. Such lives must always command interest, and they may be so written as to convey useful information. On these accounts we have chosen the life of William Caxton. Through his zeal, industry, and perseverance, the art of printing was introduced into England, and firmly established here. It is a trite remark, that we know very little of the value, or even of the real nature of those advantages which have been familiar to us from our infancy, which we see all around us, the want of which never entered into our imagination, but of which, in times not very remote, our ancestors were utterly ignorant, and which are still unknown to the great majority of mankind.

At present, in our country, there could not, most probably, be found a single hovel in the most lonely and remote district, in which some books would not be found—not treasured as a great rarity and of high value, but, on the contrary, accessible to all. The art of printing has done this. Before it was found out, few books were to be seen except in monasteries, universities, and the libraries of those who were very fond of literature, or very rich. They were preserved by such as had them with the utmost care; guarded against loss equally with their most precious jewels; and never lent except with the utmost precaution, and the best security for their return.

Now, when we wish to purchase a book, we go into a bookseller's shop, pay its price, and, without delay or formality, it is our own. *Then*, if the manuscript were rare and costly, the transfer by purchase was often conducted in a manner as circumspect, and guarded by as strict and legal evidence, as were necessary in the sale and purchase of an estate. *Now*, very little labour or time is requisite to ascertain where the scarcest books are to be procured. *Then*, as Dr. Middleton remarks, it was not only often difficult to procure them, but even to know where they were to be bought. *Now*, a small portion of the week's wages of a labouring man is sufficient to purchase books, which, while only existing in manuscript, could not be obtained except at the cost of a sum equal to his whole year's earnings: and for the manuscripts of many works, sums were *then* given equivalent (taking the value of money at those periods into the account) to the income of most persons in the middle ranks of life at present, and to what would now purchase a whole library suited to their station and adequate to their desires.

Then, not only did all books exist solely in manuscript, but, in many instances, there were few copies of those manuscripts; in some cases, perhaps not a dozen. Their destruction, therefore, at all times and under all circumstances, must have been no improbable event; and in those days of almost uninterrupted warfare and devastation, it very frequently occurred. Some were absolutely destroyed, no copies remained; others were mutilated and rendered imperfect, and their imperfections could not be removed. Others were lost by negligence, or too much care for their preservation during scenes of rapine and warfare, and in the midst of the plunder of ignorant and barbarian soldiers; and thus withdrawn, for ever, or for a long period, from the perusal and instruction of mankind. *Now*, since the invention of printing, the utter destruction, or the irreparable mutilation of a book, cannot scarcely occur, at least after it has once passed from the printing-office into the shops of the booksellers: if such an event could take place even then, the dispersion of an usual edition of seven hundred or one thousand copies among purchasers in every part of the kingdom, renders it perfectly secure from destruction or loss.

In the days of manuscript books, what expense and labour must have been submitted to, what a length of time must have elapsed, before an author could have conveyed his discoveries, or reasonings, or instructions, what would benefit or bless human life, to one thousandth part of the number of readers to whom the art of printing enables him to convey the fruits of his study or imagination with infinitely less expense and labour, and in an infinitely shorter space of time! What would our ancestors, who lived before printing was discovered, have said, had they, after having been present in the House of Commons till two or three o'clock in the morning, read at their breakfast table a detailed account of speeches, which had occupied nearly twelve hours in the delivery, and learnt that not one or two, but many thousand copies were, at that time, circulating?

Such is a very general representation of the state and means of literary communication before printing was discovered: whoever reflects on it will not be surprised that the progress of mankind, in every thing useful and valuable, was extremely slow and difficult. Individual and uncommunicated knowledge cannot purify itself from error; and, till printing was discovered, how much knowledge must necessarily have been individual and uncommunicated! The greater the number of minds that are brought to bear on any topic of research, experiment or thought, the sooner will its truth be ascertained and established. But when "there were no books in the world but what were written out by hand, with great labour and expense, the method of publishing them was necessarily very slow, and the price very dear, so that the rich only and curious would be disposed and able to purchase them." In these circumstances, error gained strength; important and valuable truths died at their very birth, or struggled useless and unproductive till the art of printing nourished them to maturity, and enabled them to strike their roots deeply and widely, and to produce their natural and genuine fruit of practical good to the human race.

But no general picture, however strongly and accurately it may be drawn, can speak so emphatically, either to the understanding or the imagination, as a picture, the outlines of which are filled up with strokes, minute but characteristic. No general contrast can exhibit a difference so clearly and powerfully as a contrast that enters into detail, and sets the individual circumstances directly in array against one another.

The facts already stated may enable and dispose our readers to prize, with some degree of justice, the advantages derived from the art of printing, and to form a vague and imperfect notion of what the state and amount of knowledge must have been, when all the books in the world were written out by hand. But we think we shall render these feelings and impressions much more vivid, distinct and permanent—we shall set the inestimable advantages derived from the art of printing in a clearer and more powerful light—we shall impress the contrast between our own means of improvement and those possessed by our ancestors, and even by the enlightened philosophers of Greece and Rome, in the very noon-tide of their intellectual vigour and glory, more deeply—if, before we give a sketch of the invention of printing, and of the life of Caxton, by whom the infant art was introduced into this country, and established here—we devote two chapters to a detail—first, of the modes and materials employed for the communication and transmission of knowledge among the Greeks and Romans, and during the dark and middle ages; and secondly, of the writing and copying of manuscripts—where it was executed, and by whom—their rarity and value—destruction—loss and recovery. We shall take care that the facts detailed in these chapters are well established—that they are curious and interesting, and, above all, that they bear directly and powerfully on the grand object we have in view,—to draw the deliberate attention and the well-grounded belief of our readers to this important truth, that the press has bestowed, is at present bestowing, and cannot cease to bestow, on mankind greater blessings than any other art has done or can do; since, without it, knowledge, and, consequently, all the benefits derived from knowledge, must have crept on with slow and feeble steps, whereas, with it, knowledge must proceed at a steady, onward pace, and with a vigour that will tread down or remove every obstacle.

Chapter II.

A Description of the Modes and Materials for communicating and transmitting Knowledge before the Invention of Printing.

The few and simple laws, necessary in the very earliest stages of society, seem, at first, among the Greeks, to have been set to music, and chanted or sung. Afterwards they were engraven on a hard and solid substance, as stone, metal or wood. According to some authors, the laws of Solon were engraved on tablets of wood, so constructed that they might be turned round in wooden cases. Some of his laws, however, were certainly engraven on stone. The laws of the Twelve Tables among the Romans were engraven on oaken planks, ivory tables, or brass; most probably on the last. In order to give the Athenians an opportunity of judging deliberately on a proposed law, it was engraven on a tablet, which was hung up for some days at the Statue of the Heroes, the most public and frequented place in the city of Athens. And that no man might plead ignorance of his duty, the laws, when passed, were engraven on the walls of the royal portico; and persons were appointed to transcribe such as were worn or defaced, and to enter the new ones. The Arundelian Marbles, preserved in the University of Oxford, sufficiently prove for what a variety of purposes inscriptions on stone were used among the ancients. Some of the inscriptions on them record treaties, others the victories or good qualities and deeds of distinguished persons, others miscellaneous events: most of them, however, are sepulchral. By far the most important and celebrated is the Parian Chronicle, which, when entire, contained a chronology of Greece, particularly of Athens, for a period of 1318 years, viz. from the reign of Cecrops, A. C. 1582, to the archonship of Diognetus, A. C. 264. The Romans engraved on brass, even so late as the reign of the Emperors, in general, their code (plebiscita), contracts, conventions, and public records. The landmarks of estates were engraven on the same metal. The Roman soldiers were allowed, in the field of battle, to write their wills on their bucklers or scabbards; and in many cabinets are preserved the discharges of soldiers, written on copper plates. Lead was employed as well as brass for preserving treaties and laws. And Pausanias informs us that he had seen, in the Temple of the Muses, the Works and Days of Hesiod, inscribed on leaden tables. In the year 1699 Montfauçon purchased, at Rome, a book of eight leaden leaves, (including two which formed the cover,) four inches long and three inches wide. Leaden rings were fastened on the back, through which a small leaden rod ran, to keep the leaves together.

Wood, however, was most generally used, both for public and private purposes, in various forms and modes. The inscription of laws on it has been already mentioned. Even in the 4th century the laws of the Emperors were published on wooden tables, painted with white lead; and formerly the Swedes inscribed or engraved their laws on wood: hence their term Balkar (laws), from *balkan*, a balk or beam. Wooden boards, either plain or covered with wax, were used long before the age of Homer: the former were called Schedæ, whence our word *schedule*. At first, the bare wood was engraven with an iron style: the overlaying them with wax was a subsequent invention. The styles used in both cases were of metal, ivory, or bone; one end pointed, the other smooth, for the purpose of erasing: hence our word *style*, used metaphorically, to signify the choice and arrangement of words employed by an author to express his thoughts. These tablets, or thin slices of wood, when fastened together, formed a book, *Codex*, so called from its resemblance to the trunk of a tree cut into planks. Hence our word *code*. When the Romans wrote letters on their tablets, they fastened them together with thread, and put a seal upon the knot. Table-books continued in use so late as the fourteenth century, and even later, as Chaucer evidently describes one in the Sumpner's Tale[*]. They were then formed into a book by means of parchment bands glued to the backs of the leaves. The Roman boys used them at school; and in the middle ages, young men learning the sciences had table-books, and psalms for meditation were written on them. The expenses of Philip le Bel, written on tables of wax, may be seen in the library of St. Victor, at Paris; and in the archives of the town-hall of Hanover, are twelve wooden boards, covered with wax, on which are inscribed the names of the owners of houses in that city. There is reason to believe that this enumeration was made at the beginning of the fifteenth century. The ancients generally used box and citron wood; in the middle ages beech was principally employed. The rich Romans used thin pieces of ivory, instead of wooden tablets. The edicts of the senate, the proceedings of the Roman magistrates, the principal transactions of the emperors, and the affairs of the princes, were recorded on ivory leaves or tablets. These were deposited in the magnificent library founded by Trajan at Rome.

The employment of leaves for the transmission of ideas is of great antiquity; and it is still common in different parts of the east. Hence the word *folio*, (from the Latin folium, a leaf,) and the meaning of *leaf*, when applied to a book. This mode of writing on leaves seems to have been superseded by the use of the bark—a material employed in every age and quarter of the globe. The outer bark was seldom used, being too coarse and rough. The inner bark was preferred, especially that of the lime tree. This bark the Romans called *liber*—hence *Liber*, the Latin name for a book. In order that these bark books might be conveniently carried they were rolled up; and in this form called *volumen;* this name was afterwards applied to rolls of paper and parchment—hence the origin of the word *volume*, applied to modern books, though of a different shape. Ancient manuscripts in bark are very scarce; but the use of bark for books still prevails in the east, especially among the Birmans. The custom of making books from bark prevailed among our Scandinavian and Saxon ancestors: the bark of the beech tree was most commonly used. The primitive meaning of the Anglo-Saxon word *boc* is the beech tree; its secondary meaning, a book—and hence our word, *book*. There are still extant some letters, and even love-letters, written by the ancient Scandinavians on pieces of bark. A very curious library of the kind was discovered some time ago among the Calmucs: the books were very long and narrow; their leaves of thick bark, varnished over; the writing white on a black ground.

Linen cloth, on which letters were drawn or painted with pencils, was employed by the Egyptians when, it is supposed, they wished to transmit such things as they designed to last very long.

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[*] His felaw had a staf tipped with horn,
A pair of tables, all of ivory,
And a peintel (style) ypolished fetisly (neatly),
And wrote always the names, as he stood,
Of all folk that yave hem any good. (v. 33-37.)

In the British Museum there is a piece of writing of this nature, taken out of a mummy. The Romans likewise employed linen (*libri lintei*) not merely for what related to private subjects and persons, but also to enter the names of magistrates, treaties, and other public documents.

The employment of the skins of animals, rudely prepared, is stated by Herodotus to have originated with the Ionians, as a substitute for the papyrus, when it could not be procured without much difficulty and expense: those of sheep, goats, and asses were preferred. Several of these books are in the Vatican, the Royal Library of Paris, and some other libraries. The poems of Homer were written on the intestines of a serpent in letters of gold: this roll was first deposited in the library of Ptolemy Philadelphus, and afterwards taken to the great library of Constantinople, where it was destroyed by fire in the sixth century: it was 120 feet long.

Leather, or skins prepared in the present manner, seems to have been often used by the Jews, on which to write the Law, Pentateuch, and other parts of their Sacred Scriptures. Dr. Buchanan informs us, that in the coffer of the synagogue of the Black Jews, in Malayala, there is an ancient copy of the Law, written on a roll of leather; it is about fifteen feet long; the skins are sewed together. A copy of the Pentateuch, written beautifully in Hebrew characters, (without vowel points,) large, and of a square form, belonged formerly to M. Santander. It occupied fifty-seven skins, which were fastened together with the same material.

The Egyptian papyrus was applied to the purpose of writing upon before the preparation of parchment and its application to the same use were known. But in order to notice in connexion all the subjects employed by the ancients, which have been entirely superseded (except in very few instances) by the use of paper, we shall postpone our account of the papyrus, till we have stated a few particulars regarding the ancient use of parchment.

The common opinion, derived from the authority of Varro and Pliny, that the preparation of parchment from skins owes its origin to a dispute between Eumenes, King of Pergamus, and one of the Ptolemies, concerning their respective libraries, in consequence of which the Egyptian king prohibited the exportation of papyrus, and Eumenes invented parchment, is certainly unfounded. Its manufacture and use are mentioned by Josephus, Diodorus Siculus, and other authors, as having been known long before the age of the Ptolemies: the name given to it by the ancients, however, Charta Pergamena, (paper of Pergamus,) renders it highly probable that its mode of preparation was improved, or its manufacture and use more general there, than in other places. Most of the ancient manuscripts now extant are written on parchment. From their appearance, the parchment has evidently been polished: according to ancient authors, by the pumice stone. They used three kinds—that of the natural colour; the yellow, bicolor membrana of Persius, which seems to have been so called because one side of the leaf was white, the other yellow; and the purple; the parchment being tinged with that colour, when silver or golden letters were to be used. It sometimes happened that parchment of the very finest kind was extremely scarce: about the year 1120, "one Martin Hugh, being appointed by the convent of St. Edmund bury to write and illuminate a grand copy of the Bible, for their library, could procure no parchment for this purpose in England."

Vellum, a finer kind of parchment made from the skins of very young calves, was also prepared and used by the ancients, and in the dark and middle ages, for writing upon. There is one manuscript of vellum, of a violet colour, all the letters of which are of silver, except the initials, which are of gold,—which we particularly notice, for two reasons: first, it is the only specimen extant of the parent tongue, from which our own language, and the languages of Sweden, Denmark, Iceland, Norway, the Netherlands, and Germany, are derived; and, secondly, it was long supposed by many to exhibit a very near approach to printing, nearly 1000 years before the art was invented—we allude to the Gothic translation of the Gospels, by Ulphilas, in the fourth century. An imperfect copy of it is preserved in the library of Upsal. It is called the 'Codex Argenteus,' or silver book. The letters appear, and were generally judged, to have been stamped or imprinted, singly, on the vellum, with hot metal types, in the same manner as book-binders at present letter the backs of books. We are not aware that this opinion was called in question, till Mr. Coxe minutely and closely examined the MS., when he convinced himself that each letter was painted, or drawn in the same manner as the initial letters in several of the finest missals. He seems also doubtful, whether to call the leaves vellum, parchment or papyrus.

We come now to paper. The most ancient kind was made from the *papyrus*, whence the word *paper* is derived. This is a species of rush, which the ancients procured exclusively on the banks of the Nile. The particular species, till lately, was not known; but it is now ascertained to be the cyperus papyrus of Linnæus, growing on the banks of different rivers in the east, and likewise, we believe, in Trinidad. The term *biblos*, originally applied by the Greeks to the inner bark of trees, and equivalent to the liber of the Romans, was afterwards more usually applied to the papyrus. Thence the term was transferred to books in general; and now it is confined by us to the scripture, as *the* book.

It is not known when the papyrus was first manufactured into paper; but there were certainly at a very early period, at least three hundred years before Alexander, manufactories of it at Memphis. Afterwards, and at the time of the conquest of Egypt, by the Romans, it was made chiefly at Alexandria. Till this conquest, however, the paper was of inferior quality. The Roman artists paid great attention to its improvement, and at length made it of considerable thickness, perfectly white and smooth. Even in this state, however, it was so friable and weak, that, when great durability was requisite, leaves of parchment were intermixed with those of papyrus. "Thus the firmness of the one substance defended the brittleness of the other, and great numbers of books, so constituted, have resisted the accidents and decays of twelve centuries."

The papyrus was highly useful to the ancient Egyptians, on many accounts, besides that of supplying them with paper: from the pith they extracted a sweet and nutritive juice; from the harder and lower parts they formed cups, &c.; staves, and ribs of boats, from the upper and more flexible part; and the fibrous part was manufactured into cloth, sails, ropes, strings, shoes, wicks for lamps, and paper. Pliny gives a full description of the manner in which it was made by the ancients; and Bruce, who succeeded in making it, both in Abyssinia and Egypt, has offered several very curious observations on the natural history of the papyrus, in the seventh vol. of his Travels, 8vo. edition, page 117, &c. In one point he differs from the account given by Pliny, of the mode of manufacturing paper from it. According to the latter, one layer of the fibrous coats of the plant was laid across another layer, on a table; they were then connected together by the muddy water of the Nile. Mr. Bruce affirms, that the water of the Nile is in no degree glutinous, and that the strips of papyrus adhere together solely by means of the saccharine matter, with which the juice of the plant is abundantly impregnated. He adds, that the Nile water must have been used simply to dissolve this saccharine matter, perfectly and equally. The cemented fibres were pressed, dried, beat with a mallet, and polished with a tooth, shell, or other smooth and solid substance. The Roman artists, in Alexandria, paid great attention to the operations of washing, beating, glueing, sizing, and polishing. It was sized in the same manner as paper from rags is at present. After the first sizing, it was beat with a hammer; sized the second time, pressed, and then polished. It was then cut into various sizes,—never more, however, according to Pliny, than thirteen inches wide. The same author mentions a great variety of kinds, to each of which a specific name was given.

For at least three hundred years before Christ, this article was exported in large quantities from Egypt. Of the extent and value of the manufactures, in Alexandria, and of the wealth derived from them, we may form some idea from an anecdote of Firmus. This person, the friend and ally of Zenobia, queen of Palmyra, a wealthy merchant, or rather manufacturer of paper and glue, in Alexandria, broke into that city in the middle of the third century, at the head of a furious multitude, "assumed the imperial purple, coined money, published edicts, and raised an army, which he boasted he could maintain from the sole profits of his manufactures." The time when the manufacture of this paper was lost, or superseded, is not known. The possession of Egypt by the Saracens certainly interrupted and diminished its manufacture and export; and it is generally supposed that few, if any, manuscripts on papyrus are of a later date than the eighth or ninth century. About this period, cotton paper was first made:

according to some, in Bucharia; according to others, it had been known long before in China and Persia. There is no doubt, however, that the Arabs, having gained a knowledge of the process, established a manufactory at Ceuta, and afterwards in Spain; and thus introduced it into Europe, about the twelfth century. In the next century this paper was in common use in the eastern empire, and in Sicily. At first it was made of raw cotton; then of old worn-out cotton cloth. While the paper manufactories of Spain were possessed by the Arabians, this article was of a very coarse and inferior quality, in consequence of their employing only mortars, and hand or horse-mills, to reduce the wool or cloth to a pulp; but as soon as their Christian labourers got possession of the paper mills of Toledo and Valencia, they worked them to more advantage, by the use of water-mills, an improved method of grinding and stamping, and by the invention or adoption of moulds. The use of cotton paper became general only in the thirteenth century; and about the middle of the fourteenth, it was almost entirely superseded by paper from linen rags, such as is at present made and used in Europe, and wherever Europeans have settled or colonised. There is much uncertainty respecting the exact time when linen paper was invented, and in what country. It is probable that at first a mixture of cotton and linen rags was employed, especially in those countries, where flax was much and easily cultivated, and where cotton was an article of import, and consequently scarce and dear. Montfauçon, who, on these subjects, is great authority on account of the diligence and extent of his researches, could find no books, either in France or Italy, made of linen paper, before the year 1270. A specimen a little earlier, however, in 1239, has been discovered by De Váines. In the fourteenth century, the use of this kind of paper became general. Italy seems to have had paper manufactures, for exportation, at this time. In 1380, part of the cargo of a ship, from Genoa to Sluys, in Flanders, which was driven ashore on the coast of England, consisted of twenty-two bales of writing paper. The oldest German paper-mill was erected at Nuremberg, in 1390. There are English manuscripts, on linen paper, so early as 1340 and 1342; but the manufacture was not introduced, according to the general opinion, into this country, till the year 1588. At that time a German, named Spielman, jeweller to Queen Elizabeth, erected a paper-mill at Dartford, in Kent. This opinion, however, has been controverted on good grounds; as the paper used by Wynkyn de Worde (who may justly be considered as Caxton's real successor) for Bartholomeus, *de proprietatibus rerum*—described by Mr. Dibdin, "as one of the most splendid typographical productions of the early British press," was made at Hertford by John Tate, junior, who may therefore be deemed the earliest paper-maker in England.* Our principal supply of fine paper, for printing and writing, was from the Continent—(Holland and France chiefly)—till about one hundred years since. At this period two-thirds of the paper used was home made; at present, besides manufacturing sufficient for our own use, we export it to a considerable amount.

The instruments employed to write with, by the ancients, and in the dark and middle ages, of course varied according to the nature of the materials on which they wrote. They may be divided into two kinds: those which acted immediately, and those which acted by the assistance of fluids; of the first kind were the wedge and chisel, for inscriptions on stone, wood, and metal; and the style, for wax tablets. The last has been already mentioned and described; the others need no description. As the style was too sharp for writing on parchment and Egyptian paper, and moreover, was not adapted for holding or conveying a fluid, a species of reed was employed. The Egyptian reeds were preferred, but many others were also used. They were cut in the form of our modern pens, and split in the points; when they became blunt, they were sharpened either with a knife, or on a rough stone. Persons of rank and fortune often wrote with a calamus of silver—something probably like our silver pens. However carefully made or mended, the strokes made by the reed-pens were in general coarse and uneven. Both the styles and the reeds were carefully kept in cases. From ancient authors, as well as from the figures in manuscripts, we learn that they used a sponge to cleanse the reed, and to rub out such letters as were written by mistake; a knife for mending the reed; pumice, for a similar purpose, or to smooth the parchment; compasses for measuring the distances of the lines; scissars, for cutting the paper; a puncher, to point out the beginning and end of each line; a rule, to draw lines, and divide the sheets into columns; a glass, containing sand, and another glass filled with water, probably to mix with the ink.

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* John Tate, the younger—
Which late hath in England do make this paper thynne,
That now in our English, this boke is printed inne.
Proemium to Bartholomeus, about 1494.

Neither the particular species of calamus, used as pens by the ancients, nor the manner in which they prepared them for this purpose, is known. This is remarkable, since all the places, where these reeds grow wild, have been ascertained, and explored by botanists: with so little success, however, that after a variety of learned as well as scientific conjectures, the calamus of the ancients has not yet found a place in the botanical system of Linneus.

This is yet more remarkable, as reeds are still employed by many eastern nations to write with. Ranwolf, who travelled in the sixteenth century, informs us that canes for pens were sold in the shops of Turkey, small, hollow within, smooth without, and of a brownish colour. Tavernier, Chardin, Tournefort, and other travellers, give a similar account, adding, that the reeds are about the size of large swan quills, and are cut and split in the same manner that we do quills, except that their nib is much larger. The best grow near the Persian Gulph. It is highly probable, that, of whatever species these are, they are of the same as those employed by the ancients; and that the mode of preparing them, still practised in the east, was followed by the ancients. They are put for some months in a dunghill; this gives them a dark yellow colour, a fine polish, and the requisite hardness.

Reeds continued to be used even so late as the eighth century, though there can be no doubt that quill pens were known in the middle of the seventh. The earliest author who uses the word *penna* for a writing pen, is Isidorus, who lived in that century; and towards the latter end of the same century, a Latin sonnet to a pen was written by an Anglo-Saxon author. There is, indeed, in the Medicean Library, a MS. of Virgil, written in the beginning of the 5th century, evidently, from the gradual and regular fineness of the hair strokes, by some instrument as elastic as a quill; but there is no proof that it was really written with a quill. Considering that pens from quills were certainly known in the seventh century, they must have come into general use very slowly; for in 1433, a present of a bundle of quills was sent from Venice by a monk, with a letter, in which he says, "Shew the bundle to Brother Nicholas, *that he may choose a quill.*"

The composition and the colours of the ink used by the ancients were various. Lamp-black, or the black taken from burnt ivory, and soot from furnaces and baths, according to Pliny and other writers, formed the basis of it: the black liquor of the cuttle fish is also said to have been used as ink, principally on the authority of a metaphorical expression of the poet Persius. But of whatever ingredients it was made, it is certain, from chemical analysis, from the solidity and blackness in the most ancient manuscripts, and from an inkstand found at Herculaneum, in which the ink appears like a thick oil, that the ink then made was much more opaque as well as encaustic than that used at present. Inks, red, purple and blue, and also silver and gold inks, were much employed by the ancients; the red was made from vermilion, cinnabar, and carmine; the purple from the *murex;* one kind of this coloured ink, called the sacred encauster, was set apart for the sole use of the emperors. The subscription at the end of most Greek manuscripts, containing the name of the copyist, and the year, month, day, and sometimes hour, when he finished his labour, were generally written, in the period of the Lower Empire, in purple ink. Golden ink was used by the Greeks much more than by the Romans. The manufacture both of it and silver ink was a distinct and extensive, as well as a lucrative business in the middle ages; and another distinct business was that of inscribing the titles, capitals or emphatic words, in coloured and gold or silver inks.

CHAPTER III.

Manuscript Books—where written and copied, and by whom—Causes of their Destruction or Loss—their Rarity and high price—Libraries—Schools.

THE foregoing chapter proves very strongly and clearly the obstacles and impediments in the way of the communication and transmission of knowledge among the ancients, and in the dark and middle ages, in so far as the nature of the materials employed for those purposes is concerned. Masses of stone or marble, metal, or blocks or planks of wood, were too heavy and cumbrous to circulate: in order to learn what the inscriptions on them related to, it was necessary that they should be consulted on the spot. Even after better materials were used, such as tablets, parchment, and the papyrus paper, the difficulties and disadvantages were great. Wax tablets might answer for notes, letters, or very short treaties, but scarcely for writings of any great length. Besides it appears that they were chiefly intended and applied for private use, and never circulated. Parchment never could have been abundant and cheap; and being, at least during the Greek and Roman period, manufactured exclusively or principally, in one place, other parts of the world must have been dependant for their supply upon it. Papyrus paper was cheaper, and in much greater abundance; but for a supply of it, the world was indebted to Egypt alone; and we have seen how this supply was cut off or much diminished when the Saracens obtained possession of that country.

The invention of paper from linen rags succeeded. Dr. Robertson remarks that "it preceded the first dawning of letters and improvement in knowledge towards the close of the eleventh century, and that by means of it, not only the number of manuscripts increased, but the study of the sciences was wonderfully facilitated." So far, indeed, as respects *material*, after this period, the European world was nearly as well off for the means of circulating and transmitting knowledge, as we of the present day are. But we must never lose sight of this fact, that all books were manuscript, written by the hand. How this was accomplished, by whom, and where, form part of the inquiries answered in the present chapter.

If we look at the voluminous works of some of the ancient Fathers or schoolmen, we must be struck with astonishment, when we reflect that copies of them were made by the pen alone, and that their circulation, which seems to have been extensive, could not proceed unless the pen supplied copies. From this single fact, we shall be prepared to expect that the copyists of books must, at all times before the invention of printing, have been very numerous; following a regular business, that afforded full employment, and required experience and skill, as well as legible and expeditious writing.

This was indeed the case in Greece, Rome, Alexandria, and other places before the Christian era; and after its establishment, in the monasteries, universities, and many other places. At Athens copyists by profession were numerous, and gained a steady and considerable livelihood, as, notwithstanding their number and labours, books were seldom very common. The booksellers of Athens employed them principally to copy books of amusement, most of which were exported to the adjoining countries on the shores of the Mediterranean, and sometimes even to the Greek colonies on the Euxine. In many of these places the business of copying was carried on, and libraries formed. Individuals also employed themselves, occasionally, in copying; and there are instances recorded of some forming their own libraries by copying every book they wished to put into them. Not long after the death of Alexander, the love of science and literature passed from Athens and Greece generally, to Alexandria, where, patronised by the Ptolemies, they flourished vigorously, and for a considerable period seemed to have concentred themselves. Under the same roof with the celebrated library there, (which is said to have contained at one time 700,000 volumes,) were extensive offices, regularly and completely fitted up for the business of transcribing books: and it was the practice of foreign princes, who wished for copies of books, to maintain copyists in this city. Some of the libraries of Rome, having been destroyed by fire, the Emperor Domitian sent copyists to Alexandria, that he might be able to replace them. This practice continued for some centuries after Domitian, probably till the conquest of Egypt by the Saracens in the middle of the seventh century. The supposed invention of parchment by a king of Pergamus has already been mentioned. This is doubtful; but it is certain that there were extensive manufactories of that article there, almost entirely for the use of the copyists, who were attached to the royal library; this is said to have contained 200,000 books.

We are ignorant of the class of people in ancient Greece, by whom the business of copying was chiefly followed, and of the education they received. But we know, that, in Rome, the copyists were usually slaves who had received a liberal education. Sometimes they were freedmen, especially those employed by private individuals. The Romans, of rank and consequence, seldom wrote their works, speeches, or even letters themselves;—it was customary for them to dictate to such of their slaves or freedmen, as had been liberally educated, who wrote the MS. in a kind of short hand, or rather in contractions and signs which stood for words and syllables. If the work was intended for publication, it was sent to the booksellers who employed people to copy it fairly in the ordinary characters. This kind of short hand is said to have been invented by Xenophon: it was certainly much extended and improved by the Romans. Tyro, Cicero's freedman, in copying the speeches of Cato, first regulated the method of taking down public harangues—hence their *notæ* took his name, *Notæ Tyronianæ;* they were in use in the tenth and eleventh centuries. Many of the speeches of Cicero and other distinguished statesmen and orators, in the senate or at the forum, were taken down by short-hand writers stationed there. Extreme rapidity of writing was absolutely necessary: this led them to contract words more and more, and to multiply the number of the contractions. In many cases, either for the sake of greater expedition, or of secrecy, "signs or marks which could be currently made with one dash or scratch of the *style*, and without lifting or turning it, came to be employed, instead of those letters which were themselves abbreviations of words. This mode of dictation, and of rapid and abbreviated writing, continued to be practised, at least as late as the fourth century."

This, itself, must have occasioned many errors; but the chief source of errors in the MSS. of the ancients arose from the transcribers employed by the booksellers; these were often ignorant and careless; and complaints on that score are made against them, at a very early period, by Lucilius, in one of his satires, and afterwards by Cicero, Strabo, Martial, and other authors. Strabo informs us that in his time the copyists were so careless that they neglected to compare what they wrote with the exemplar: this, he adds, has been the case in many works copied for sale, at Rome and Alexandria. Individuals seldom copied books for their own use at Rome. Plutarch, indeed, mentions, that Cato the Censor, out of his great anxiety for the education of his son, wrote out, for his use, with his own hand, in large letters, such historical works as he wished him to read; but this is evidently noticed as an extraordinary and unusual action. When a person, from the absence of his scribe or other cause, wrote his letters himself, the extreme rapidity to which he had been accustomed while dictating, unavoidably produced rapid and illegible writing. Cicero, in reply to the complaint of his brother Quintus, that he could not read his letters, tells him that when he wrote himself, he wrote with whatever pen he took up, whether good or bad *.

When the seat of the Roman empire was transferred to Constantinople, that city, for upwards of one thousand years, became the chief seat of literature, and source of books. The liberality and munificence of the emperors in purchasing books, and having them copied, are repeatedly noticed, especially by the Byzantine historians. The manuscripts executed in that city are, in general, beautifully written, and sometimes most splendidly decorated. Though the number of books, and the demand for them in ancient times, were, comparatively, extremely limited, yet, in consequence of the frequent destruction of manuscripts, by common accidents and casualties, the business of copyists must have been very extensive. When the Roman empire began to decline, their destruction was extended and increased in the midst of the turbulence and rapine of the civil contests for the imperial throne. Christianity, properly understood, and exercising its due influence on the understanding and character, must be a warm friend of knowledge and literature: but the spurious Christianity, believed and acted upon in the dark ages, was hostile to some of the noblest productions of the human mind. The temples of the Heathens, with the public libraries they contained, were the objects of vengeance and destruction. The classics were represented as sinful books. In addition to these causes, the capture of Rome in the fifth century,—the devastations committed by Alaric, Genseric, and Attila—and the plunder of Milan, which, next to Rome, was the principal repository for books in Italy—greatly reduced the number of manuscripts, or contributed to their mutilation.

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* Quintilian informs us that wax tablets were preferred to paper, when it was necessary or desirable to write with rapidity, as the pen required to be frequently raised from the paper, to be dipped in the ink—an intermission and delay not required when writing with the style on tablets.

Soon after monachism was regularly formed in the sixth century, the monks, especially those under the rules of St. Benedict, which did not prohibit the reading of the classics, turned their attention to procuring and copying manuscripts. Most of these indeed were worthless; but truth obliges us to add, that many of the abbots, and even monks, employed themselves in procuring or copying the choicest works of Greece and Rome*. Cassiodorus, to use the words of Gibbon, "after passing thirty years in the honours of the world, was blessed with an equal term of repose in the devout and studious solitude of Squillace." To this place, the monastery of Monte Cassino, in Calabria, he carried his own extensive library, which he greatly enlarged by manuscripts bought at a considerable expense in various parts of Italy. His fondness for literature spread among the monks; he encouraged them to copy manuscripts; and even wrote a treatise giving minute directions for copying with correctness and facility. What he did there seems to have been imitated in the other monasteries of that part of Italy; for fifty religious houses there are mentioned, which afterwards principally supplied the libraries of Rome, Venice, Florence, and Milan, with manuscripts. The north of Italy had also similar establishments in monasteries for copying. The monastery of Benedictines at Bobbio, according to Tiraboschi, was celebrated for its cultivation of literature. The same author fixes the systematic commencement of the copying of the classics in the sixth century. The monasteries of the Morea, and of the islands of Eubea and Crete, but more especially the numerous religious houses which covered the heights and sides of Mount Athos, had always some of their inhabitants employed in the transcription of books.

It was a fixed rule in religious houses that all their inmates should devote a portion of the day to labour. Such as were unable to work at employments requiring toil and strength, or particular skill, discharged their duty by copying manuscripts; and as it was another rule, that every vacancy should be filled up, as soon as ever it took place, there was always a considerable number of copyists. In every great abbey, an apartment, called the *scriptorium*, was expressly fitted up, as a writing-room. That of St. Alban's abbey was built about 1080, by a Norman, who ordered many volumes to be written there; the exemplars were furnished by Archbishop Lanfranc. Estates and legacies were often bequeathed for the support of the scriptorium, and tithes appropriated for the express purpose of copying books. The transcription of the service books for the choir was intrusted to boys and novices; but the missals and Bibles were ordered to be written by monks of mature age and discretion. Persons qualified by experience and superior learning were appointed to revise every manuscript that came from the scriptorium. The copying of books was executed in other places besides monasteries; sometimes by individuals, from their attachment to literature; but generally by persons who made it their professed employment. Richard of Bury, bishop of Durham, in the thirteenth century, is highly celebrated for his love and encouragement of literature. Besides his libraries, which were numerous in all his palaces, and the books which covered the floor of his common apartments, so that it was no easy matter to approach him, he had a great number of copyists, illuminators, and binders, in his pay. While Chancellor and Treasurer of England, he preferred receiving the usual perquisites of his office in books, instead of the usual new year's gifts and presents. Copyists were found in all the great towns; but were most numerous in such as had universities. It is said that more than six thousand persons at Paris subsisted by copying and illuminating manuscripts, at the time when printing was introduced into that city: they held their privilege under the University. We know little certain of the rate at which copyists were paid; one fact, however, mentioned by Stow, in his 'Survey of London,' may be given: In 1433, 66*l.* 13*s.* 4*d.* was paid for transcribing a copy of the works of Nicholas de Lyra, in two volumes, to be chained in the library of the Grey Friars. The usual price of wheat at this time was 5*s.* 4*d.*

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* Some of the early fathers employed much of their time in dictating their works. Eusebius gives a curious picture of Origen's mode of composition: he had seven *notarii*, or short-hand writers, who succeeded each other, as they became weary with writing: he had also a regular establishment of men and young women, who wrote beautifully, to copy his works.

the quarter. The wages of a ploughman were one penny a day; of a sawyer, four-pence; and of a stone-cutter, the same[*].

The Jews practised the business of copying, and greatly excelled in fine and regular writing. But they confined their labours chiefly to the Old Testament, and their own religious books. In some of the Hebrew manuscripts, executed by them, the letters are so equal, that they seem to have been printed. Even at present, as Mr. Butler remarks, "those who have not seen the rolls used in the synagogues, can have no conception of the exquisite beauty, correctness, and equality, of the writing."

The ancients most commonly wrote only on one side of the parchment or paper, joining the sheets together till their work was entirely written[†]. The manuscript was then rolled on a cylinder, and called volumen. More than one book was seldom included in a volume. Thus the fifteen books of Ovid's Metamorphoses, were in fifteen volumes. The volume being formed, a ball of wood, bone, ivory, &c., was fastened to it on the outside, for ornament and security. This was the most ancient mode of binding books, if so it may be called; and it was followed long after the time of Augustus. The square form, it is said, was first given to books by one of the kings of Pergamus; and it is certain that Julius Cæsar introduced the custom of dividing his letters to the senate, and folding them like our books. Previously to his time, when the consuls wrote to the senate, their letters were rolled up in a *volume*. When books were exposed to sale, they were covered with skins, which were rendered smooth by pumice-stone. There was one particular street in Rome, or rather a part of one street, in which the booksellers chiefly lived. In the middle ages books were usually bound by monks. There were also trading binders, called ligatores, and persons whose sole business it was to sell covers White sheep-skin, pasted on a wooden board, sometimes overlapping the leaves, and fastened with a metal cross, was the most common kind of binding. It was deemed the duty of the sacrists in particular to bind and clasp the books. There is a curious charter of Charlemagne's, in *790*, to the abbots and monks of Sithin, by which he grants them an unlimited right of hunting, on condition that the skins of the deer they killed should be used in making them gloves and girdles, and *covers for their books*.

We know little about booksellers in the early part of the dark ages; it is probable, indeed, that for many centuries there was no mode of procuring a copy of a book but by borrowing it, and employing a copyist, to transcribe it. Books, however, as well as other articles, were occasionally sold in the porches of the churches—a place where law meetings were held, and money paid, in order that its payment might be attested, if necessary, by some of the persons there assembled. We may suppose that, for the same reason, books were sold there. This custom seems to have been adopted from a similar one which prevailed in the porticoes of the Greek and Roman temples; for in them goods were sold, and business transacted. We may also trace to the schools which were established there, for children even of the highest rank,—the custom mentioned by Shakspeare, of parish schools being held in the porch, or in a room above the church.

Mr. Hallam says booksellers appear in the latter part of the twelfth century; and quotes Peter of Blois, who mentions a law book which he had bought from a public seller of books. The Jews of Spain about this period were much devoted to literature: Leo Africanus alludes to one Jewish philosopher of Cordova, who, having fallen in love, turned poet: his verses, he adds, were publicly sold in a street in that city, which he calls the Booksellers'-Street; this was about the year 1220. The Greek and Roman authors adopted rather a singular custom, either to make their works sell after they were actually published, or, more probably, to create a disposition to purchase them when they should come into the hands of the booksellers. We learn from Theophrastus, Juvenal, Pliny, and Tacitus, (particularly from the last,) that a person who wished to bring his writings into notice, hired or borrowed a house, fitted up a room in it, hired forms, and circulated prospectuses, and read his productions before an audience, there and thus collected. Giraldus Cambrensis did the same in the middle ages, in order to make his works known.

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[*] It must be noticed, however, that the illuminations, as well as the ornaments, are probably included in the sum; if not the materials used, at least the workmanship. The works of Nicholas de Lyra seem to have been in high repute, and much honoured. John Whethamstede, abbot of St. Alban's, highly celebrated for his studious employment and love of literature, began, during his abbacy, a grand transcript of the Postilla of De Lyra; the ornaments and hand-writing were most splendid. The monk, who mentions it, and who lived after him, when it was still unfinished, exclaims, "God grant that this work may receive, in our days, a happy consummation."

[†] Pasting the leaves together was a distinct and regular business, carried on by persons called glutinatores. In parchment there appear to have been ruled lines to direct the writing; whereas, when writing on paper, which in general was very fine, and almost transparent, a leaf of ruled paper was put beneath. The double paper, mentioned by Pliny, on both sides of which the ancients wrote, was made by pasting two leaves together, in such a manner that the grain of the paper was crossed. The blank side of manuscripts, written on single paper, was sometimes used for rough drafts, or given to children for copy-books—hence the Latin term, *adversaria*,—a note-book, loose papers.

Having thus given an account of the manner in which manuscripts were copied and increased in monasteries, &c. we shall now state the causes of their destruction and loss. Till the establishment of Monachism, Christianity, or rather its blind and bigoted professors, were hostile to the classics; —the monasteries in a great degree made up for this by the care they took and the copies they made of them. But one of the causes of their destruction arose, even in the monasteries. The high price of parchment at all times, and its firm and tough texture, tempted and enabled the ancients to erase what had been written on it, (especially, we may suppose, when the contents were of little moment,) in order to use it again for writing upon. A manuscript of this kind was called a Palimpsest. Cicero's self-love took the alarm when his friend Tribatius wrote a letter to him on such parchment. After praising him for his parsimony, he expresses his wonder what he had erased to write such a letter, except it were his law notes; "for I cannot think that you would efface my letter to substitute your own." This practice, in the dark and middle ages, became so prevalent, and was productive of such serious consequences, the most important documents often being destroyed to make way for trash, that the emperors of Germany, in their patents of nobility, with power to create imperial notaries, inserted a clause to the following effect: "On condition that they should not make use of old or erased parchment, but that it should be quite new." The parchment was generally erased: but the monks had also a practice of taking out the writing by a chemical process; and sometimes they peeled off the surface of the parchment. They had recourse to these destructive practices, not only when they wished to add to their stock of religious works, but also when they wanted to raise a sum of money. In this case, they erased the old writing—paying little regard to its value or rarity—wrote a legend or a psalter, and sold it to the common people. Though it had been long known that the writings of classical authors lay concealed and nearly obliterated beneath the literary rubbish of the monks—and this in numerous cases—for Montfauçon affirms that the greater part of the MSS. he had examined were of this description; yet no steps were taken to recover the original and more valuable writings, till Angelo Mai undertook the task: he has succeeded in recovering several works, the most important of which is a considerable portion of Cicero de Republica that had been erased, and replaced by St. Augustine's Commentary on the Psalms.

The conquest of Egypt by the Saracens, which rendered it almost impracticable to procure papyrus paper, and the consequent high price of parchment, and temptation to erasure, were injurious to literature, not only in this respect, but by the alarm it gave to Europe. This event, their subsequent conquest of Spain, the Norman invasion of France, and the wars by which various parts of Europe were so long and dreadfully afflicted, afforded opportunities and pretexts for plundering the convents and cities, and thus caused the destruction and loss of a great number of valuable manuscripts.

We have already alluded, generally, to the facility with which books can be procured now, and the extreme difficulty even of ascertaining where they were to be found before the invention of printing; when that was ascertained, of gaining access to them, or a loan of them; and the high price at which they were then sold. We shall now give several instances of the truth of this general statement, for, in no other manner, can we so clearly point out and prove the very great advantages that literature and science have derived from the art of printing. The materials employed formerly to write upon—the cumbersome or perishable nature of some—the dearness of others—the length of time necessarily taken up, in writing books with the hand —the few places in which they were accumulated—the difficulty of access to them—their liability to destruction,

—and the practice of the monks' erasing the writing,—have prepared our readers to anticipate their great rarity and value. We must premise, however, that though the facts we shall state will sufficiently prove the high price of manuscript books, yet we cannot gain a precise notion of the subject, because, in many cases, that arose in a great measure from the splendour of their illuminations, and cost of outward workmanship—and, setting aside this consideration, because it is not possible to ascertain exactly the comparative value of money in those ages, and in the present times. Where we have dates, we shall add the price of wheat, and the wages of labour—perhaps the best criteria for ascertaining the purchasing power of money. We shall begin with instances of the rarity of manuscripts, as it is shown in the anxiety to borrow them, and the conditions on which they were lent. We have already mentioned Richard of Bury. In his Philobiblion he devotes one entire chapter expressly to an enumeration of the conditions on which books were to be lent to strangers. In 1299, the Bishop of Winchester borrowed a Bible in two volumes folio, from a convent in that city, giving a bond drawn up in a most formal and solemn manner, for its due return. This Bible had been given to the convent by a former bishop, and in consideration of this gift, and 100 marks, the monks founded a daily mass for the soul of the donor. In the same century several Latin Bibles were given to the University of Oxford, on condition that the students who read them should deposit a cautionary pledge. And even after manuscripts were multiplied by the invention of linen paper, it was enacted by the statutes of St. Mary's College, at Oxford, in 1446, that "no scholar shall occupy a book in the library above one hour, or two hours at most, lest others should be hindered from the use of the same." Money was often lent on the deposit of a book; and there were public chests in the universities, and other places in which the books so deposited were kept. They were often particularly named and described in wills—generally left to a relation or friend, in fee, and for the term of his life, and afterwards to the library of some religious house. "When a book was bought," observes Mr. Warton, "the affair was of so much importance, that it was customary to assemble persons of consequence and character, and to make a formal record that they were present on the occasion." The same author adds, "Even so late as the year 1471, when Louis XI. of France borrowed the works of the Arabian physician Rhasis, from the faculty of medicine at Paris, he not only deposited, by way of pledge, a quantity of valuable plate, but was obliged to procure a nobleman to join with him as surety in a deed, by which he bound himself to return it under a considerable forfeiture." Long and violent altercations, and even lawsuits, sometimes took place in consequence of the disputed property of a book.

Books were so scarce in Spain in the tenth century, that several monasteries had among them only one copy of the Bible, of Jerome's Epistles, and of several other religious books; and monasteries had frequently only one missal. There are some curious instances given by Lupus, abbot of Ferrieris, of the extreme scarcity of *classical* manuscripts in the middle of the ninth century: he was much devoted to literature; and, from his letters, appears to have been indefatigable in his endeavours to find out such manuscripts, in order to borrow and copy them. In a letter to the Pope he earnestly requests of him a copy of Quintilian, and of a treatise of Cicero; for, he adds, though we have some fragments of them, a complete copy is not to be found in France. In two other of his letters, he requests of a brother abbot the loan of several manuscripts, which he assures him shall be copied and returned as soon as possible by a faithful messenger. Another time he sent a special messenger to borrow a manuscript, promising that he would take very great care of it, and return it by a safe opportunity, and requesting the person who lent it to him, if he were asked to whom he had lent it, to reply, to some near relations of his own, who had been very urgent to borrow it. Another manuscript, which he seems to have prized much, and a loan of which had been so frequently requested, that he thought of *banishing* it somewhere that it might not be destroyed or lost, he tells a friend he may perhaps lend him, when he comes to see him, but that he will not trust it to the messenger who had been sent for it, though a monk, and trustworthy, because he was travelling on foot. We shall extract only one more instance of the scarcity of manuscripts from the letters of Lupus;

he requests a friend to apply in his own name to an abbot of a monastery, to have a copy made of Suetonius; "for," he adds, "in this part of the world, the work is no where to be found."

We possess few facts respecting the price of manuscript books among the ancients. Plato, who seems to have spared no trouble or money in order to enrich his library, especially with philosophical works, paid a hundred minæ, equal to 375*l.*, for three small treatises by Philolaus, the Pythagorean; and, after the death of Speusippus, Plato's disciple, his books were purchased by Aristotle; they were few in number; he paid for them three talents, about 675*l.* It is said that St. Jerome nearly ruined himself by the purchase of religious works alone. And, though, at this period, we have no specific prices of works, yet, from the account already given of their rarity, of the difficulty of ascertaining even where they were to be found, and of the extreme reluctance, in many instances, even to lend them, we may easily credit the general fact, that persons of a moderate fortune could not afford to purchase them, and that, by the rich even, they could seldom be procured without the payment of sums that required the sacrifice of some luxuries. The mere money paid for them, in the dark ages, whenever a person distinguished himself for his love of literature, was seldom the sole or the principal expense. It was often necessary to send to a great distance; to spend much time in finding out where they were. In the ninth century, an English bishop was obliged to make five journies to Rome, principally in order to purchase books; for one of his books thus procured, Alfred gave him an estate of eight hides of land, or as much land as eight ploughs could till. About the period of the invention of cotton paper, 1174, the homilies of St. Bede and St. Augustine's Psalter, were bought by a prior in Winchester, from the monks of Dorchester, in Oxfordshire, for twelve measures of barley, and a pall richly embroidered in silver. Stow informs us, that in 1274, a Bible, in nine volumes, fairly written, with a gloss or comment, sold for fifty marks, 33*l.* 6*s.* 8*d.*: about this time the price of wheat averaged about 3*s.* 4*d.* a quarter; a labourer's wages were 1½*d.* a day; a harvest man's, 2*d.* In a blank page of Comestor's Scholastic History, deposited in the British Museum, it is stated, that this MS. was taken from the King of France, at the battle of Poictiers: it was afterwards purchased by the Earl of Salisbury for a hundred marks, and directed, by the last will of his Countess, to be sold for forty livres. One hundred marks were equivalent to 66*l.* 13*s.* 4*d.* This sum was exactly the pay of Henry Percy, keeper of Berwick Castle, in 1359; at this time the king's surgeon's pay was 5*l.* 13*s.* 4*d.* per annum, and one shilling a day beside. Master carpenters had four-pence a day, their servants two-pence; the price of wheat about 6*s.* 8*d.* a quarter. At the beginning of the century, some books were bequeathed to Merton College, Oxford, of which the following are the names and valuation: A Scholastic History, 20*s.*; a Concordantia, 10*s.*; the four greater Prophets, with glosses, 5*s.*; a Psalter, with glosses, 10*s.*; St. Austin, on Genesis, 10*s.* About the year 1400, a copy of the Roman de la Rou was sold before the palace gate at Paris, for forty crowns, or 33*l.* 6*s.* 6*d.* The Countess of Anjou paid for a copy of the Homilies of Bishop Haiman, two hundred sheep, five quarters of wheat, five quarters of barley, and five quarters of millet. On the conquest of Paris, in 1425, the Duke of Bedford sent the royal library to England: it consisted of only eight hundred and fifty-three volumes, but it was valued at two thousand two hundred and twenty-three livres, rather more than the same number of pounds sterling. At this time the price of a cow was about 8*s.*, of a horse about 20*s.* And the pension paid by the English Government to the Earl of Wallachia, who had been driven out of his territories by the Turks, was 26*l.* 13*s.* 4*d.* per annum. This library is thought to have formed the foundation of the celebrated library of Humphrey Duke of Gloucester. This nobleman was one of the most zealous and liberal patrons of literature and learned men of his age; he invited learned foreigners into England, whom he retained in his service, employing them in copying and translating from Greek into Latin; and he had constantly persons in his pay collecting valuable manuscripts for him. He gave to the University of Oxford, about the year 1440, six hundred volumes, one hundred and twenty of which alone were valued at more than 1000*l.* Wheat about this period might be exported, when not above 6*s.* 8*d.* a quarter. In the middle of this century, a nobleman of Bologne, desirous of purchasing a copy of Livy, which had been transcribed by the celebrated Poggio, was obliged to sell an estate for this purpose, and with the purchase money, Poggio bought another estate, near Florence. Archbishop Usher tells us, from the Register of William Alnwick, Bishop of Norwich, that in 1429, the price of one of Wickliffe's English New Testaments, was four marks and forty pence, or 2*l.* 16*s.* 8*d.*, which, the Archbishop observed, "is as much as will now (about 1630) buy forty new Testaments." Afterwards copies were multiplied so much, in consequence of the increase of Wickliffe's disciples, that the price fell to 20*s.*, when the price of a Porteus or breviary was six marks. In 1468, 1*l.* 6*s.* 8*d.* was lent on the security of a MS. of Petrus Comestor (a work already mentioned), deposited as a pledge. Wheat at this time was 6*s.* 8*d.* a quarter; beef, 10*s.* the carcase; mutton, 1*s.* 4*d.*; veal, 2*s.* 6*d.*; pork, 2*s.*; ale, 1½*d.* a gallon. When Faust sold his Bibles at Paris (about 1460), the price of a parchment copy was reduced from four or five hundred to sixty, fifty, and forty crowns[*]. Other instances might be given of the extreme rarity and enormous price of books, in every country, and at all periods, previous to the invention of printing: but these are amply sufficient to prove the facilities which that discovery has given to the spread of literature and science, by removing this most serious and formidable impediment.

Had not sovereigns and rich individuals formed libraries to which men of learning had access, knowledge could not have advanced, even in the very slow manner in which it did; as they, in general, were too poor to purchase books, and had not sufficient leisure to find out where they were to be bought, or, while dispersed, where they were to be met with. The most celebrated libraries in ancient times, which may fairly be regarded as having contained a very large portion of the books then existing, were, 1. The Alexandrian Library founded by Ptolemy Soter, who reigned about 300 B. C. His successors enlarged it; one of them seized all books imported into Egypt, giving copies of them, made by his orders, and at his expense, to the proprietors: in a similar manner he got from the Athenians, the originals of Æschylus, Sophocles, and Euripides, returning them only copies, and giving them fifteen talents in exchange, upwards of £3000. This library suffered much during the first Alexandrine war; and was afterwards totally destroyed by the Calif Omar in A. D. 642. 2. The library founded by Pisistratus at Athens. This and the other libraries of this city, continued to flourish till after the time of Justinian. 3. Julius Cæsar projected a library at Rome, which was to be, strictly speaking, public; but his assassination frustrated the design: and the first public library was erected by Asinius Pollio, in the reign of Augustus. This emperor also founded two public libraries, the Octavian and the Palatine —the latter survived till the time of Gregory the Great, about the end of the sixth century. 4. But the most extensive and splendid of the libraries at Rome, was the Ulpian, founded by Trajan: it is believed that, at the suggestion of Pliny the younger, this emperor commanded all the books that were found in the conquered cities to be placed in this library. Most of the principal cities throughout the Roman empire, at this time, had public libraries. The desolation of the western empire by the barbarians destroyed or dispersed most of the books in them, so that, in this part of the world, after this period, and during the dark ages, monasteries almost exclusively possessed libraries. In the eastern empire it was different: both Constantinople and Alexandria preserved theirs, till the Turks obtained possession of these cities. The library of the former was founded by Constantine, and enlarged by succeeding emperors, especially by Julian and Theodosius the younger.

Dr. Henry, after mentioning Alfred's purchase of one book, for an estate of eight hides of land, observes—"At this rate none but kings, bishops, and abbots, could be possessed of any books: which is the reason that there were then no schools but in kings' palaces, bishops' sees, or monasteries!" It is generally believed that there were no public schools in Rome till three hundred years after its foundation; parents teaching their children the little they knew. Even after the establishment of schools, private education at home was common. The teachers were generally slaves or freed men; and a slave always accompanied the boys of rank to school, carrying a box, containing books, paper, tablets, and instruments for writing. In learning their letters they were instructed by another boy, or usher*. Homer was taught to the Greek boys, and Virgil to the Roman. They were moved to different schools, according to their proficiency: being taught to read and write in one, and arithmetic, by *calculi* or counters, in a separate school. The porticoes of temples were common places for schools. In an ancient bas-relief, published by Winkelman, the education of two children of rank is represented: one about twelve years old holds a double tablet, long, and fastened by a hinge. The master, half naked, like the ancient philosophers, holds a roll (volumen), and is addressing the child. Some of the table-books must have been large; for, in Plautus, a school-boy, seventeen years old, is represented as breaking his master's head with one. From the origin of monasteries till the close of the tenth century, there were no schools in Europe, except those belonging to monasteries or episcopal churches. At the beginning of the eleventh century, they were opened in most of the cities of Italy and France, by qualified persons among both the laity and clergy. But though their general introduction and establishment must be assigned to this period, yet it is certain that Charlemagne founded several in his dominions; and long before his reign St. Augustin was an usher in a school. His business was to preside over the dress, morals, gait, &c., of his pupils, and to sit with them in a kind of anti-school, separated from the principal school by a curtain. Here they said their lessons to the usher, before they went to the master; when the curtain was drawn back. In the middle ages, there were distinct schools for clerks, for laymen, and for girls; and two hundred children at a time are represented as learning their letters. Itinerant schoolmasters were also common. The whole of the education, however, even of those of the highest ranks, seldom went beyond reading and writing, and the more simple rules of arithmetic. Parochial grammar schools, in villages, were established in the fifteenth century. The following account of their origin is given by Mr. Fosbroke: "To prevent the growth of Wickliffism, it had been made penal to put children to private teachers; and the consequent incessant influx to only a few schools, rendered, in 1447, grammar learning so low, that several clergymen in London petitioned parliament for leave to set up schools in their respective churches, in order to check seminaries, conducted by illiterate men. Thus commenced grammar schools, properly so called†."

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[*] The supplying of books for divine service—Missal—Porteus, or Breviary—Manual, &c. originally fell upon the rector; as they were all written, and some of them beautifully illuminated, it was a very expensive duty. On the institution of vicars, the parishioners agreed to supply some of the books: Among them were the Antiphoners, two of which, in 1424, cost twenty-six marks, or 17*l.* 6*s.* 8*d.* The vicars were at the expense of binding and preserving the books; also of finding the Porteus; the price of this was about five or six marks.

Chapter IV.

Restorers of Literature, and Discoverers of Manuscripts, in the Middle Ages—First steps towards the Art of Printing—Invention of that Art—Early History—Introduction of it into the Kingdoms of Continental Europe.

It is generally the fate of discoveries that are made prematurely, and under unfavourable circumstances, either to be strangled in their birth, or to struggle through a very short and useless existence. Had the art of printing been invented during the deepest ignorance and gloom of the dark ages, its value and importance would not have been appreciated, and it might gradually have sunk into neglect and total oblivion. Books were indeed excessively rare and dear; but very few sought for them, for few had the curiosity or ability to read, and fewer the money to purchase them. After the tenth century, literature began to revive; paper from linen rags was invented; a tendency to commerce appeared. This caused a gradual accumulation of capital, and rendered necessary some attention to learning. Then succeeded the agitation of men's minds, which preceded the Reformation, and which could not be set at rest but by reading and inquiry. The monks themselves, so far as they contributed to the perusal of legends and miraculous stories, were the unconscious instruments of that spreading desire for knowledge, which ushered in the invention of printing, and which issued in the Reformation itself.

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* See Dodwell's Greece, for further proofs of a system of education in ancient Greece, similar to that of Bell and Lancaster. (Vol. ii. p. 37.)

† "It was not till the reign of Henry IV. (1399—1413) that villeins, farmers, and mechanics, were permitted, by law, to put their children to school (7 Henry IV. chap. 17;) and long after that they dared not to educate a son for the church, without a license from their lord."—(Henry's England, book v. chap. 4. sect. 1.)

We have already named several individuals who, even in the darkest ages, spent much of their time or money, in endeavouring to discover and procure manuscripts. Long before the fall of Constantinople, the love of classical literature had been gradually reviving;—that event increased it, by compelling a great number of learned Greeks to seek a shelter in Italy. But it could not be gratified, till the manuscripts, which lay buried and neglected, were brought to light. As the labours of those who may justly be called the restorers of classical literature, were mainly instrumental in producing that state of things, which turned men's minds towards the invention of printing, and nourished it to maturity, when invented, we shall give a short account of the most celebrated of them, before we proceed to the invention itself.

Silvester II., before he became pope, which was in the last year of the tenth century, had been indefatigable in acquiring and communicating learning, and these qualities distinguished him during his whole life. In order to obtain a knowledge of the sciences and manuscripts, he visited Spain, and caused Italy, and the countries beyond the Alps, to be diligently explored. The Crusades interrupted the spread of literature; but in the fourteenth century, Petrarch roused his countrymen from their slumber—inspired a general love of literature—nourished and rewarded it by his own productions; and rescued the classics from the dungeons, where they had been hitherto shut up from the light and instruction of mankind. "He never passed an old convent, without searching its library, or knew of a friend travelling into those quarters, where he supposed books to be concealed, without entreaties to procure for him some classical manuscripts." Had not such a man appeared at this time, it is probable that most of the classical manuscripts would have been totally lost; so that in this case, he might have excited among his countrymen the love of literature, without being able to gratify or nourish it. Boccaccio, who shares with Petrarch the glory of having enriched the Italian language with its most perfect beauties, at the very moment when it may be said to have begun to exist, shares also with him the glory of being a zealous and successful restorer of classical manuscripts and literature. No man, during the first half of the fifteenth century, devoted himself with so much industry to this search, or made so good a use of them, when discovered, as Poggio. No difficulty, no want of assistance, no expense or labour discouraged him. His youth was spent in travelling to attain what seemed to be the sole object of his life; and when he became secretary to the Popes, eight of whom employed him in succession, he used the influence and opportunities his situation gave him, for the promotion of literature and the collecting of manuscripts at Rome. To these names we shall add only those of the Medici family; Emanuel Chrysolas, who was one of the first who introduced a knowledge of the Greek language and literature into Italy; and Theodore Gaza.

Europe seemed now ripe for the art of printing, and to require it. Persons of high rank felt a more general and powerful love of literature than they had ever experienced before. The minds of the great mass of the people too were now beginning to work; but materials were wanting on which they might work, and by which they might work. At this important crisis, the art of printing was discovered, and an impulse given to knowledge which now no power, no conceivable combination of circumstances can possibly destroy.

Playing-cards, which were known and used in Germany at the very beginning of the fourteenth century, were first painted; but towards the end of that century a method of printing them by blocks was discovered. This was the first step towards the art of printing. The manufacturers of playing-cards naturally turned this discovery of printing from blocks to advantage and profit by engraving the images of saints—for which there was a regular and great demand—on wood. This may be considered as the second step. Books of Images were of two kinds: those without any text, and those with text; but even in the first words and sentences are interspersed. A wood cut of St. Christopher, the oldest known of the first kind, is now in the collection of Earl Spencer: at the foot of it are three short sentences, engraved and printed together with the figure, with the date 1423. The most celebrated of the books of images without text is the Biblia Pauperum. It consists of forty plates of figures and images, with sentences relating to them, the whole engraven on wood on one side of the paper. It seems to be a kind of catechism of the Bible, and was sold at a low price to young persons and the common people; it has no date. Another work, a system of artificial memory, engraven on wood, in the same manner as the Biblia Pauperum, has the text separate from the figures; fifteen plates of each. The characters are very large, resembling those on ancient monuments. But, "of all the ancient books of images," observes Mr. Horne, "which preceded the invention of printing, the Speculum Salutis is confessedly the most perfect both in its design and execution." It is a collection of historical passages from the Scriptures, with a few from profane history. It was very popular, frequently reprinted, and translated into German, Flemish, and other languages.

The change and improvement from the manner in which these books of images were executed to moveable wooden characters, seems obvious and not difficult; but there is no evidence that these were ever used, except in the capital letters of some early printed books. It has been, indeed, contended strenuously by several antiquarians, that Lewis Coster, of Haarlem, invented and used them; that he, therefore, was the original inventor of the art of printing, and that Haarlem was the place where the invention was first put into practice. But it is now proved, that this opinion is without foundation; that wooden types were never used; that the claims of Coster of Haarlem cannot stand the test of accurate investigation; and that the art of printing, as at present practised, with moveable metal types, was discovered by John Guthenberg, of Mayence, about the year 1438.

Three years before this, Guthenberg entered into a partnership with three citizens of Strasburg, binding himself to disclose a secret which would enrich them all. One of the partners dying, and some of the most important implements having been stolen from the workshop, a lawsuit took place. In the course of this lawsuit, five witnesses, among whom was Guthenberg's confidential servant, proved that he (Guthenberg) was the first who practised the art of printing with moveable types. The result was a dissolution of partnership. The whole proceedings on this trial are in existence, and have been published in the original German.

After this, Guthenberg returned, poor and disappointed, but not dispirited, to his native city, Mayence. It is doubtful whether he had hitherto really printed any thing. Heinecken, who has investigated this subject with great diligence and labour, is of opinion that he had ruined both himself and his partners, without being able to produce a single clean and legible leaf. However that may be, in 1450, he entered into partnership at Mayence, with John Fust; they seem at first to have gone back to wooden blocks, and then to have tried moveable wooden letters and moveable metal ones, formed with a knife: all without effect. This partnership was also unfortunate; for, in consequence of the great expense incurred by Fust (who supplied the capital), in printing a Latin Bible, he commenced a suit against Guthenberg; the latter was obliged to give up his apparatus to Fust. It is not certain whether, during their partnership, they found out the art of casting characters in metal, which they had previously been obliged to cut with the hand; or whether this great improvement was made by Schoeffer, an ingenious man, who assisted them at this time, and was afterwards taken into partnership by Fust. The general opinion is, that the idea of punches and matrices for casting metal types originated with Schoeffer. He certainly improved this method, by rendering it more certain, easy, and expeditious.

Guthenberg, not discouraged by this second misfortune, established a new printing office, until 1465, when he obtained a situation, with a good salary, under the Elector Adolphus. In the mean time, Fust, in conjunction with Schoeffer, continued printing. In August, 1457, they published a beautiful edition of the Psalms; one of the earliest books yet discovered which has the name of the place and printers, with the date annexed. In 1462, the city of Mayence was taken by the Elector Adolphus, when the partners suffered much; and their workmen dispersing themselves, the art of printing was thus spread over Europe. Their masters, however, still carried on the business in Mayence. Fust's name appears to a Treatise of Cicero printed in 1466; all subsequent books have Schoeffer's name alone; he continued to print till his death in 1502, when he was succeeded by his son[*].

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[*] In order to give a clearer idea of the progress of the art in its infancy, we shall subjoin short notices of some of the works executed by Guthenberg and his partners. The two earliest works are supposed to be an alphabet, engraved on a plate for the use of schools, and some doctrinal tracts. Then followed two editions of Donatus on the parts of speech: the first from wooden blocks, which are still in the Royal Library of Paris; the second with moveable types

The date and cause of the dispersion of Fust and Schoeffer's workmen, and the consequent spreading of the art of printing over the continent of Europe, have been already stated. The respective periods of its first introduction into the principal continental kingdoms, together with some interesting anecdotes, we shall now mention. The first book printed at Rome was Cicero's Letters to his friend, in 1457. The printers were Conrad Sweynheim, and Arnold Pannartz. They left Germany for Italy in 1465, having served their apprenticeship to Fust and his partner. At first they settled at the monastery of Lubeaco, in the neighbourhood of Rome, where they printed the works of Lactantius, being encouraged and assisted by the monks, who were Benedictines, and very rich and learned. On their removal to Rome they were equally patronised by John Andreas the Pope's librarian. He not only supplied them with the most valuable manuscripts from the Vatican, but prepared the copy, corrected the proofs, prefixed dedications, prefaces, &c. Notwithstanding the encouragement they met with, they were obliged to petition the Pope for relief and assistance in 1472, having printed during the seven previous years, twenty-eight different works, some of them very large and expensive, the impressions of which amounted to 12,475 volumes. In this petition, after stating that they were the first who introduced this art into his holiness' territories, and the number of volumes printed by them, they added that their house was full of books in quires, but destitute of the necessaries of life. As they contrived to print for some time afterwards, it is supposed that assistance was granted them.

The first book printed at Venice was also Cicero's Epistles; the printer, John de Spira, the date 1469. He and his brother, also a printer, natives of Germany, surpassed all their predecessors in the beauty of their types and the elegance of their impressions; they employed two very learned men as correctors of their press. The Spiras were the first who applied the art on a regular and extensive scale to the publication of the classics. By an order of the senate, 1469, the exclusive privilege of printing the letters of Cicero and Pliny was granted to them for five years, in consequence of the beauty of their impressions. Venice became celebrated for its types, and supplied the printers of Rome with them. One of the best printers of the fifteenth century was settled at Nuremberg, his name was Coburger; he was styled by his contemporaries the prince of booksellers and printers: he employed daily twenty-four presses and one hundred men, besides furnishing work to the printers of Basle, Paris, and Lyons. His books, which relate chiefly to the canon law and theology, are distinguished for the blackness of the ink, and the squareness and fineness of the type, as well as the good quality of the paper, and the excellence of the press-work.

The first work from the Paris press is dated 1470; the printers were three Germans from Colmar. On the establishment of their office, the copyists, finding their business much injured, presented a memorial to the parliament; but Lewis XI. interfered in their behalf.

Lewis, who, amidst all his faults, was an encourager of literature, is said to have sent Nicolas Jenson, a native of France, to Mayence, to learn the art of printing, in 1470. But, owing to civil dissensions in his kingdom, Jenson settled at Venice, where he printed from

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on vellum. The celebrated first edition of the Bible from metal types; remarkable for the texture of the paper, excellence of execution, and blackness and lustre of the ink; supposed to have been printed in 1455. The expense of printing it gave rise to the lawsuit between Guthenberg and Fust. Like all other very ancient printed books, it has no title or paging, and many of the initial letters are painted by illumination. In 1456, Guthenberg printed an almanack, the first ever printed, and the very first book with a certain date. In 1457, Fust and Schoeffer printed their celebrated Psalter. In a colophon, (the sentence frequently added at the conclusion of a work by the early printers,) the invention of the art of printing is announced to the public in boasting, though by no means unreasonable or unwarranted terms. This Psalter is printed on vellum; the psalms in larger letters than the hymns, all uncommonly black. The capital letters are cut in wood; the largest of these, which are black, red, and blue, it is supposed must have passed three times through the press. Not more than six or seven copies are known to be in existence. The first edition of the Latin Bible, with a date, at Mayence, by Fust and Schoeffer, in 1462. Fust sold by himself, or by his agents, copies of this Bible at Paris, as manuscript, and supplied them so regularly and abundantly as to lower the price. From the facility with which he supplied them, and the uniformity of the copies, he was taken up as a necromancer; hence arose the story of the Devil and Dr. Faustus. The books were seized either on this occasion, or aftewards, in virtue of the *droit d'aubaine*, on the death of his agent, but they were restored by order of Louis XI. In 1465 Fust and Schoeffer published an edition of Cicero's Offices, "the first tribute of the new art to polite literature." After the death of Fust, about 1466, Schoeffer carried on the printing business alone for thirty-five or thirty-six years, in the course of which period he executed a great many works. By far the most important of these was an edition of Justinian's Institutes, the date is not known. In 1484 he printed an Herbal in 4to., with figures of plants; and in 1485, a folio edition of it. In 1490 he printed a third edition of the Mentz Psalter. In the preceding editions the full chant was written, in this it is printed. Schoeffer terminated his labours by a fourth edition of the Psalter in 1502.

1470 to 1480. He introduced great improvements; planning and reducing to their present proportions the characters called *roman*, so that his works are justly deemed very highly finished in every respect.

The first book printed at Naples, was in 1471. Two years afterwards, printing was introduced into Buda, in Hungary. The first work printed at Basle, in Switzerland, is dated 1474. The same year appeared a book, printed by the monks of a convent in the Rhingau. They were of the Augustine order, and by their rules, they were obliged to copy the works of the Fathers and ecclesiastical writers as part of their regular duty, and likewise as their chief means of subsistence. The discovery of printing having deprived them of these means, they immediately applied themselves to learn and practise that art, and were thus enabled at the same time to support themselves and fulfil the spirit of their rule.

The first work printed in Bohemia is dated 1476, but the printer's name is not known. John Snell, a German printer, invited into Sweden by the administrator Stein Sture, printed the first book in that kingdom in 1483. John Mathison, a Swede, who was patronised by the Bishop of Holun in Iceland, introduced the art of printing into that remote and desolate island, in the year 1531. The first book printed in Portugal is dated 1489; it is a commentary on the Pentateuch in Hebrew, and from the printers' names, they appear to have been Jews.

In 1493 the art was introduced into Denmark, when a grammatical treatise was published. The first treatise relating to commerce seems to have been published at Provins, in 1496. Three years afterwards the Catholicon was printed in Bretagne, or Breton, French, and Latin.

The first work printed in Moravia, is dated 1500: it is a treatise against the Waldenses. In 1560, a Russian merchant, having bought a quantity of types, printing press, &c., introduced the art into Moscow. The mob, however, at the instigation, it is supposed, of the priests, destroyed the office, press, and types.

The most early printed books were principally of the folio and quarto size. In 1465 the old Gothic character was changed for a kind of semi-Gothic, in the Lactantius, printed at Lubeaco. The roman type was first used at Rome in 1467, and soon afterwards brought to perfection by Nicolas Jenson. The celebrated printer, Aldus Manutius, introduced towards the end of the fifteenth century, the *italic*. Aldus was extremely careful in correcting his proofs, so that he never printed more than two sheets a week. He printed a great number of Latin and Italian books in 8vo., which are executed with great elegance and correctness. In the edition of Cicero, printed at Mayence, 1465, a few sentences in Greek types are given. The same year, Sweynheim and Pannartz, having procured a very small quantity of Greek types, began to print the Lactantius, already mentioned; before the work was completed, however, they seem to have procured a further supply, for in the first part of the work a blank is left wherever a long sentence occurs, whereas, after the middle of the work, all the Greek quotations are printed. The first book, entirely Greek, is supposed to be the Greek grammar of Lascaris, printed at Milan in 1476. Aldus, in addition to his other merits, is justly celebrated for having first produced beautiful and correct editions of Greek works. Printing in Hebrew was first executed by Soncino, in Milan, in 1482. The Pentateuch was printed there this year. The first Polyglott bible, in Hebrew, Arabic, Chaldee, Greek, and Latin, was printed at Genoa in 1516, by Pormo. Aldus seems to have planned, and even to have begun to execute, a Polyglott bible, in Hebrew, Greek, and Latin. There is one specimen page, in folio, preserved in the Royal Library at Paris.

Till 1476 or 1480, the titles of books were printed on separate leaves. In the infancy of the art, blanks were left for initial letters, which were afterwards filled up by the illuminators; but this trade did not long survive the invention of printing. Divisions into sentences were seldom made; the orthography varied much; punctuation was confined to the colon, period, and an oblique stroke. This is supposed to have arisen from a desire to imitate manuscripts as near as possible. Aldus added the semicolon; notes of interrogation and admiration were not used till long afterwards. The paper was very thick and solid; this, and the frequent use of vellum, were the result of the desire to imitate manuscripts. It is known, besides, that at that period the disproportion between the price of paper and vellum was not nearly so great as at present. Very early printed books are also distinguished by their numerous and difficult abbreviations, by the absence of signatures and catch-words, and of the printer's name, place, and date; when inserted, they are at the end of the book. Signatures, however, were used in 1472 and 1474; and catch-words, which appear in manuscripts of the eleventh century, were first used in printing, by Spira, at Venice, about the same time. They are at present little used, either on the continent or in Britain.

CHAPTER V.

Life of WILLIAM CAXTON.

WILLIAM CAXTON was born in the Weald of Kent, as he himself tells us; in what part of it, and in what year, is not known, but it is supposed about the year 1412. Of the rank or employment of his parents we are entirely ignorant. His father came to London, and resided with his son, in Westminster, at the time of his greatest fame, as a printer. There he died at a very advanced age, in 1480. It may be presumed that his parents were in good circumstances from the education they gave him, and the business to which they put him. At this period learning of all kinds was at a much lower ebb in England than in most of the continental states of Europe; in consequence, principally, of the civil wars in which the nation was embroiled, the habits of restlessness thus produced, and the constant pre-occupation of men's time and thoughts in promoting the cause they espoused, and in protecting their lives and property. Under these circumstances the most plain and common education was often neglected. Caxton's parents, however, performed their duty to him: "I am bounden," he says, "to pray for my father and mother's souls, that, in my youth, sent me to school, by which, by the sufferance of God, I get my living, I hope truly." When he was about fifteen or sixteen, he was put apprentice to William Large, a considerable mercer, of the city of London, and afterwards sheriff and mayor. The name, *mercer*, was given at this time to general merchants, trading in all kinds of goods. After he had served his apprenticeship, Caxton took up his freedom in the Mercers' Company, and became a citizen of London. That he conducted himself, while an apprentice, to the satisfaction of his master, may be presumed from the circumstance, that he was left in his will, in 1441, a legacy of twenty marks, or 13*l*. 6*s*. 8*d*., a considerable sum in those days, when the usual price of wheat was 5*s*. 4*d*. a quarter; malt, 4*s*. the quarter; and a pair of plough oxen could be purchased for about 1*l*. 3*s*.

In what manner he employed himself from the expiration of his apprenticeship, till he went abroad, is not known; but that he did not go abroad till some years afterwards, a comparison of dates will render apparent. He was born about 1412; he could not have been more than sixteen when put apprentice; so that his apprenticeship of seven years must have expired in the year 1435. The opinion, therefore, that he went into the Low Countries on the termination of his apprenticeship is not correct, as he did not leave England till 1442, the year after he received the legacy.

In what capacity or for what purpose he left England, we are ignorant;—probably as a merchant, either on his own account, or as agent for some other merchant. He informs us that he continued for the most part in the countries of Brabant, Flanders, Holland, and Zealand,—all at this time belonging to the Duke of Burgundy, one of the most powerful princes in this part of Europe, whose friendship and alliance were anxiously sought for by the kings of France and England.

In the year 1464, he was appointed by Edward IV. ambassador, along with Richard Whetenhall, "to continue and confirm a treaty of commerce with Philip, Duke of Burgundy, or, if necessary, to form a new treaty." In the commission, which is given in Rymer's Fœdera, they are styled ambassadors and special deputies; and full powers to treat are given to either, or both of them. The Low Countries were at this period the great mart of Europe, in which were to be purchased, at all times, and in great abundance, the produce and manufactures of most parts of the world. Treaties of commerce between England and them were frequently made and broken; and it required not only considerable knowledge in commercial affairs, and in the relative commercial wants and advantages of the two countries, but also a sound judgment, and much circumspection and prudence, to make or renew them. Merchants seem to have been generally employed on these occasions; and we may reasonably conjecture that Caxton's character and experience, as a merchant, and his long residence in the Netherlands, pointed him out as a fit person for this embassy.

Philip, Duke of Burgundy, was the most magnificent prince of his age: his court, one of the most polished; and his fondness for the expiring customs of chivalry, and for literature, equally great and influential. In the prologue to a book of the whole life of Jason, translated under the protection of King Edward, Caxton thus describes the chamber of this prince, in his castle of Hesdein, in Artois. It ought to be premised, that Philip had instituted the order of the Knights of the Golden Fleece. "But, well wote I, that the noble Duke Philip, first founder of this said order, did do maken a chamber in the castle of Hesdein, wherein was craftily and curiously depainted, the conquest of the Golden Fleece, by the said Jason; in which chamber I have been, and seen the said history so depainted; and in remembrance of Medea, and of her cunning and science, he had do make in the said chamber, by subtil engine, that, when he would, it should seem that it lightened, and after, thunder, snow, and rain, and all within the said chamber, as oftimes, and when it should please him, which was all made for his singular pleasure."

During his residence in the Low Countries he acquired or perfected his knowledge of the French language, gained some acquaintance with the Flemish or Dutch (as appears by his translation of Reynard the Fox from the latter); imbibed his taste for literature, and passion for romance, and made himself master of the art of printing, "at great charge and dispense," as he informs us. His passion for romance he most probably derived from his intimacy with Raoul le Fevre, chaplain to the Duke of Burgundy, and with Henry Boulonger, canon of Lausanne. The former of these persons was the author of the Romance of Jason, and of the Recueill of the Histories of Troy, both of which were afterwards translated and printed by Caxton; and at the instance of the latter he translated, compiled, and printed, 'The History and Lyf of the most Noble and Christian Prince Charles the Great, Kyng of Vienna and Emperor of Rome.'

In June, 1467, Philip Duke of Burgundy died, and was succeeded by his son, Charles. A treaty of marriage between this prince and Margaret, sister to Edward IV., was at this time negotiating, but was interrupted by the sudden death of Philip: the marriage, however, took place a year afterwards, on the 3d of June, 1468. Caxton was appointed to a situation in the household of the duchess, soon after her arrival in the Netherlands; but in what capacity, or with what salary, is not known. He seems, however, to have been on familiar terms with Margaret, and not to have been much occupied. For he informs us, that in 1469 he began translating the Histories of Troy, of his friend Raoul le Fevre, in Bruges, continued it at Ghent, and finished it at Cologne; he, however, laid the translation aside for some time. "In 1469," he says, "having no great charge or occupation, and wishing to eschew sloth and idleness—which is mother and nourisher of vices—having good leisure, being at Cologne, I set about finishing the translation. When, however, I remembered my simpleness and imperfections in French and English, I fell in despair of my works, and after I had written 5 or 6 quairs, purposed no more to have continued therein; and the quairs laid apart; and in two years after laboured no more in this work: till in a time it fortuned Lady Margaret sent for me to speak with her good Grace of divers matters, among the which I let her have knowledge of the foresaid beginning. "The Duchess," he adds, "found default in myne English, which she commanded me to amend, and to continue and make an end of the residue, which command I durst not disobey." The Duchess rewarded him liberally for his labour. In his prologue and epilogue to this work, he mentions that his eyes are dimmed with over much looking on the white paper; that his courage was not so prone and ready to labour as it had been; and that age was creeping on him daily, and enfeebling all his body;—that he had learnt and practised at great charge and dispense to ordain the said book in print; and not written with pen and ink, as other books be.

The translation of the Recueill was published at Cologne in 1471; but he had printed there, at least, two works before that; the original of the Recueill—a work unknown to German bibliographers— in 1464-7; and the oration of John Russel, on Charles, Duke of Burgundy, being created a knight of the garter in 1469. The existence of this was unknown till the year 1807, when it was discovered at the sale of Mr

Brand's books. No other book printed by Caxton at Cologne has been discovered; but that he printed there Bartholomeus de Proprietatibus Rerum, is plain from Wynkyn de Worde. This successor of Caxton printed, in 1494, Trevisa's translation of Bartholomeus; and in his proeme he requests his readers "to remember the soul of William Caxton, first printer of this boke in Latin tongue at Cologne;" this is the only instance of Caxton's having printed a Latin work, and would seem to imply some knowledge of that language.

It is supposed, that he returned to England about the year 1472, and brought with him the unsold copies of the translation of the Recueill. His first patron was Thomas Milling, Bishop of Hereford, who held the abbotship of St. Peter's, Westminster, *in commendam*. Caxton took up his residence and established his printing-office, either in the immediate neighbourhood of the abbey, or in one of the chapels attached to it.

That Caxton introduced the art of printing into England, and first practised it here, was never doubted till the year 1642: a dispute arose, at this time, between the Company of Stationers and some persons, respecting a patent for printing; the case was formally argued; and in the course of the pleadings, Caxton was proved, incontestably, to have been the first printer in England. Soon after the Restoration, a book was discovered in the public library at Cambridge, the date of which was Oxford, 1468. The probability is, however, that the date of this book is incorrect, and that it should have been 1478, not 1468; this is inferred from its being printed with separate fusile metal types, very neat and beautiful, from the regularity of the page and the appearance of signatures; and, moreover, from the fact, that no other production issued from the Oxford press till eleven years after 1468, it being highly improbable that a press connected with a university should have continued so long unemployed. But, even granting that the date is accurate, and that the book was printed in 1468, six years before the execution of any work by Caxton, the merit of Caxton, and the obligations of this country to him, are but little lessened by this circumstance.

Frequent and unprofitable disputes have arisen, at different times, and on various occasions, respecting original ~eries and inventions. He, who first unfolds and demonstrates a grand and important principle, or, by his skill, penetration, and labour, succeeds in applying a known power to new purposes of benefit to mankind, may excite our admiration for his genius or his knowledge; but if, from the circumstances of the times, and men's minds not being ripe and prepared, or from a combination of untoward and unfavourable events, or from any other cause, dependent on himself or not, his discovery or invention, of whatever nature it may be, dies with him, or is barren and unproductive, without shedding its light or influence on his contemporaries and future ages, we must withhold from him our gratitude and sense of obligation, and reserve them for the man to whom we can trace the benefits we enjoy.

The common opinion is, that the 'Game of Chess' was the first book printed by Caxton at Westminster: Mr. Dibdin, however, thinks it more probable that the Romance of Jason was the earliest specimen of his press in England. These are supposed to have been printed in 1474; this date is, indeed, specified in the 'Game of Chess,' but it is doubtful whether it signifies the year when it was written, or that in which it was printed. This book was dedicated to George Duke of Clarence, the oldest surviving brother of King Edward. Caxton enjoyed the patronage of Henry VII., and his son, Prince Arthur, as well as of Edward and his brother; some of the nobility also encouraged him. Whether their patronage and encouragement displayed themselves in a substantial and profitable manner, we do not learn, but he himself was indefatigable in cultivating this new art. Besides the labour necessarily attached to his press, he translated not fewer than five thousand closely printed folio pages, though well stricken in years. From the colophon of Wynkyn de Worde's edition of the Vitas Patrum, 1495, it appears that this book was translated out of French into English by William Caxton, of Westminster, late dead, and that he finished it "at the last day of his life." The productions of his press amount to sixty-four. Of the most interesting of these works, either from the anecdotes connected with them, from the insight they give into his life and character, or into the manner of the times, or from the specimens they afford of his talents and information, we shall give a short account, arranging them in chronological order.

1477. 'Dictes and Sayings of the Philosophers.' This is the first book printed by Caxton with the year and place specified. It was translated from the French by Antony Woodville, Earl of Rivers. This nobleman had left out some strictures on women, which were in the original French; these Caxton translated and added as an appendix in three additional leaves; of his reasons for doing so, he gives the following statement. Lord Rivers had desired him to look over the translation, and to correct it. Caxton observed that the Dictes of Socrates on Women were not there, and indulged in many conjectures respecting the reason of their omission. He supposed that some fair lady had used her influence with his lordship, or that he was courting some fair lady at the time, or that he thought Socrates said more than what was true, or that these Dictes were not in his lordship's copy: "or else peradventure that the wind had blown over the leaf at the time of the translation." As, however, his lordship had given him permission to correct the translation, Caxton thought he should not be going beyond due limits if he added these Dictes. But, he tells us, "I did not presume to put and set them in my said lord's book, but in the end apart, in the rehearsal of the works, that Lord Rivers, or any other person, if they be not pleased, may with a pen erase it, or else rend the leaf out of the book, humbly beseeching my said lord to take no displeasure on me so presuming." He then requests the reader to lay the blame on Socrates, not on him.[*] From his insertion of these strictures on women, which are not the most courtly, it has been inferred that he was a womanhater; but that he was not so, appears from some of his prologues, especially from that to the 'Knight of the Tower.' This work he was requested to translate and print by "a noble lady, who had brought forth many noble and fair daughters, which were virtuously nourished and learned."

1478. 'The Moral Proverbs of Christina, of Pisa.' The same year Caxton began to print a work called Cordyael,' but he did not finish printing it, or at least it was not published till 1480. It does not appear that any other work came from his press during this interval. These two books were also translations from the French, by Caxton's patron, Lord Rivers. Of the political life of this accomplished and amiable nobleman, who was one of the very few who, in that age, promoted the cause of literature in this country,—this is not the place to speak: his dreadful catastrophe is well known.

> "Rivers, Vaughan, and Gray,
> Ere this, lie shorter by the head at Pomfret."

Caxton gives the following account of him and his works. "The noble and virtuous Lord Anthoine, Earl Rivers, Lord Scales and of the Isle of Wight, under governor to my Lord Prince of Wales, notwithstanding the great labour and charge that he hath had in the service of the King and of the said Lord Prince, as well in Wales as in England, which hath be to him no little thought and business both in sprite and body, as the fruit thereof experimentely sheweth; yet, over that, t' enrich his virtuous disposicion, he hath put him in devoyr, at all times, when he might have a leisure, which was but startmele, to translate divers works out of French into English. Among other passed through myn hand, the book of the Wise Sayings or Dictes of Philosophers, and the wise holsom Proverbs of Christine of Pisa, set in metre. Over that, he hath made divers balads agenst the seven dedly synnes. Furthermore, he took upon him the translating of this present work, named Cordyale, trusting that both the reders and the hearers thereof should know themself hereafter the better, and amend their lyving." These ballads are supposed to be lost; but John Rouse, of Warwick, a contemporary historian, has preserved a short poem of the Earl. Rouse seems to have copied it from his handwriting; it was written during his confinement in Pomfret Castle, a short time before his death in 1483; and, as Dr. Percy justly remarks, "gives us a fine picture of the composure and steadiness with which this stout Earl beheld his approaching fate."[*]

In this year (1480) also, Caxton printed his Chronicle, and his Description of Britain which is usually subjoined to it. These were very popular, having been reprinted four times *in this century*, (twice, however, without the Description;) and seven times *in the sixteenth century*.

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[*] A manuscript of Lord Rivers's translation of this work, with an illumination representing him introducing Caxton to Edward IV., his queen, and the prince, is preserved in the Archbishop of Canterbury's Library, at Lambeth Palace.

[*] It is printed in Percy's Reliques of Ancient English Poetry, vol. ii. p. 44; and in Ritson's Ancient Songs, p. 87.

'The Mirror of the World,' 'Reynard the Fox,' from the Dutch, 'Tully
1481. on Old Age,' 'Tully on Friendship,' and 'Godfrey of Boulogne,' appeared this year. The two Treatises of Tully were translated by John Tiptoft, Earl of Worcester[*].

This year Caxton published the 'Polychronicon,' from the English ver-
1482. sion of John of Trevisa, who translated it from the Latin of Higden. It is a large volume, and seems to have been intended by Caxton as a helpmate to his Chronicle. The printing must have occupied him the whole year, as no other publication came from his press in 1482. Besides printing it, however, he added an eighth book, bringing the history down from 1357 to 1460; "because," he says, "men, whiles in this time ben oblivious and lightly forgotten, many things deygne to be put in memory; and also there cannot be founden in these days but few that wryte in their regysters such things as daily happen and fall." He was also obliged to take the trouble of altering many parts of Trevisa's language; for, though only 124 years had elapsed, many words were quite obsolete and unintelligible. This, Caxton particularly notices in the 'Polychronicon;' and at greater length in the following curious passage in the preface to his 'Eneid,' a work from his press, that will be afterwards noticed.

"After divers works, made, translated, and atchieved, having no work in hand, I, sitting in my study, where as lay many divers pamphlets and books, it happened that to my hand came a little book, in French, which late was translated out of Latin, by some noble clerk of France, which book is named 'Eneid,' as made in Latin by that noble person and great clerk, Virgil, which book I saw over, and read therein. (He then describes the contents.) In which book I had great pleasure by cause of the fair and honest terms, and words, in French, which I never saw tofore like, ne none so pleasant nor so well ordered: which book as me seemed should be much requisite to noble men to see, as well for the eloquence as histories; and when I had advised me in this said book, I deliberated, and concluded to translate it into English, and forthwith took a pen and ink, and wrote a leaf or twain, which I oversaw again, to correct it; and when I saw the fair and strange terms therein, I doubted that it should not please some gentlemen, which late blamed me, saying, that in my translations, I had over curious terms, which could not be understand of common people; and desired me to use old and homely terms in my translations; and fain would I satisfy every man, and so to do, took an old book, and read therein; and certainly the English was so rude and broad, that I could not well understand it; and also, my Lord Abbot of Westminster, did do shew to me late certain evidences, written in old English, for to reduce it into our English, now used; and certainly it was written in such wise, that was more like to Dutch than to English. I could not reduce, nor bring it to be understanden."

Again: "Certainly the language now used varieth far from that which was used and spoken when I was born; for we, Englishmen, been borne under the dominacion of the moone, which is never stedfaste, but ever wavering." In his time, the inhabitants of one county hardly understood those of another: "The most quantity of the people understand not Latin nor French, in this royaume of England." The intermixture of French words and idioms, of course, was most prevalent in the capital. "That common English, that is spoken in one shyre varyeth from another—in so much that in my dayes happened, that certain merchants were in a ship, in Thamys, for to have sailed over the sea to Zealand; and, for lack of wind, they tarried att Forland, and went to land for to refresh them; and one of them, named Sheffield, a mercer, came into an hous, and axed for mete, and especially he axed after egges; and the good wyfe answerde, that she could speke no Frenche, and the merchant was angry, for he also could speke no Frenche, but would have had egges, and she understood him not. And then at last another sayd, that he would have eyrun. Then the good wyfe sayd, that she understood him well*." Caxton seems to have been a good deal puzzled and perplexed about the language he should use in his translations; for, while some advised him to use old and homely terms: "Some honest and great clerks," he adds, "have been with me, and desired me to write the most curious terms that I could finde—and thus, betwixt plain, rude, and curious, I stand abashed." There can be no doubt, however, that either by following the advice of those honest and great clerks, or from his long residence abroad—in his translations, as Dr. Johnson observes, "'the original is so scrupulously followed, that they afford us little knowledge of our own language; though the words are English, the phrase is foreign."

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[*] This nobleman possessed great talents, received an excellent education, and devoted his purse and leisure time to the purchase of books, and the promotion and encouragement of literature. Horace Walpole remarks, that whatever disputes there may be about his titles in the state, there is no doubt but he was anciently at the head of literature, and so masterly an orator, that he drew tears from the eyes of Pope Pius II. (the celebrated Eneas Sylvius) when he visited Rome, through a curiosity of seeing the Vatican Library. (On his return to England, he presented books to the Library at Oxford, which had cost him 500 marks, upwards of 330*l.*—a large sum at this period.) His fondness for literature, and perhaps his political opinions, both being zealous Yorkists, brought him acquainted with Caxton. When Edward IV. was obliged to abandon his kingdom in order to save his life, in October, 1470, the Earl of Worcester was taken and beheaded on Tower hill, on the 15th of that month. Caxton speaks in warm and affectionate language of him. "In his time," he says, "he flowered in vertue and cunning, and to whom he knew none lyke among the Lords of the Temporalty in science and moral vertue." Again: "O, good blessed Lord God! what grete loss was it of that noble, vertuous, and well-disposed lord; and what worship had he at Rome in the presence of our holy fader, the Pope; and so in all other places unto his deth; at which deth, every man that was there might lern to die, and take his deth patientlye."

Caxton printed more books this year, than in any other. Seven bear
1483. this date. Among them were 'Gawin's Confessio Amantis;' and the 'Golden Legend.' A very full and particular account of the former is given by Mr. Dibdin, in his 'Typographical Antiquities,' vol. i., p. 177—185. Caxton informs us, that the printing of the 'Golden Legend' made him "half desperate to have left it, and to have laid it apart;" but he took courage, and went on, when the Earl of Arundel promised to take a number of copies, and to send him "a buck in summer, and a doe in winter."

He printed four books, of which two were 'Æsop;' and the 'Order of
1484. Chivalry.' Mr. Dibdin, who has seen and examined more early editions of Æsop, in different languages, than most people, considers Caxton's edition, on the whole, as the rarest of all those in the fifteenth century. His Majesty's copy of it, he adds, is the only perfect one known. In the 'Order of Chivalry,' which he translated out of French, he gives a curious picture of the manners of his age; and at the same time laments, in strong and feeling language, the decline of chivalry: "O! ye knights of England, where is the custom and usage of noble chivalry that was used in those days. What do you now, but go to the baynes (baths,) and play at dyse; and some, not well advysed, use not honest and good rule again all order of knighthode. Leve this—leve it! and read the noble volumes of St. Graal, of Lancelot, of Galaad, of Trystram, of Perseforest, of Percival, of Gavaine, and many more. There shall ye see manhode, curtsys, and gentleness. And look in latter days of the noble actes sith the Conquest; as in King Richard dayes, Cuer de Lion; Edward I. and III., and his noble sones; Syr Robert Knowles, &c. Rede Froissart. Also, behold that noble and victorious King Hary the Fifthe. I would demand a question, if I should not displese: ' How many knyghtes ben ther now in England, that have th' use and th' exercise of a knyghte. That is to wit, that he knoweth his horse, and his horse him. I suppose, an a due serche sholde be made, there sholde be many founden that lacke. The more pyte is. I would it pleased our soverayne lord, that twyse or thryce a year, or as the lest ones, he wold do cry justes of pies, to th' ende, that every knyghte sholde have hors and harneys, and also the use and craft of a knyghte; and also to tornay one against one, or two against two, and the best to have a prys—a diamond or jewels, such as should plese the prynce."

Caxton, probably, like most other persons when they become old, regarded the manners of youth as much worse than they were in his early days. We must make allowance for this failing, in reading his Picture of London, and its youthful inhabitants. "I have known it in my young age much more wealthy, prosperous and richer, than it is at this day; and the cause is, that there is almost none that intendeth to the commonweal, but only every man for his singular profit." And, in another place, "I see that the children that ben borne within the said citye encrease and proufitte not like their faders and olders: but for moste parte, after that they ben coming to their perfite years of discretion and ripeness of age, how well that their faders have left to them grete quantity of goods, yet scarcely amonge ten, two thryve. O blessed Lord, when I remember this I am all abashed; I cannot juge the cause; but fayrer, ne wiser, ne bet bespoken children in theyre youth ben no wher then ther ben in London; but at their full ryping there is no carnel, no good corn founden, but chaffe for the most parte."

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* If Caxton is correct in this story, the language of this part of Kent (in the weald of which, where he was born, he acknowledges English is spoken broad and rude) must have borrowed the word for egg from the Teutonic, and not from the Anglo-Saxon; *æg*, being the Anglo-Saxon, and *ei* the German, for an egg.

In 1485, his press was entirely occupied with romances. The first was 'Morte Arthur, the Liff of King Arthur of the Noble Knyghts of the Round Table, and in the end the dolorous Deth of them all.' This had been translated from the French, by Sir Thomas Mallery, knight; and Caxton printed it from the MS. It is a magnificent volume, and is supposed to have occupied him seven months. 2. The History of Charlemagne, already mentioned, as having been compiled and translated from two French books, by the advice of his friend Henry Boulonger, canon of Lausanne. Only one more was printed by him this year—'The Storye of the right noble, right valiant, and worthy Knight Parys;' this also he translated from the French. In the year 1486, his press seems to have been idle; at least none of his works bear this date: and in 1487, only one book appeared, entitled, 'The Book of Good Manners.' The original French, from which he translated it, he informs us, was given to him by a special friend of his, a mercer of London*. In 1488 no books appeared. In 1489 Caxton published four, of which 'The Fait of Armes and Chivalry' was one. "This was delivered to me, William Caxton, by the most Chrystin King and redoubted Prince, my natural and sovereign lord, Kyng Henry the 7th, Kyng of England and of France, in his palace of Westmestie, the 23 day of Janyure, the 4th yere of his regne; and desired and willed me to translate this said boke, and reduce it into our English and natural tongue, and to put it in imprynte." It is a compilation by Christine of Pisa, from the Military Treatises of Vegetius Frontinus, and the Arbre des Battailles. Another book printed this year was the 'Eneidos,' translated from the French; it is a mere compilation in prose of the principal events recorded in Virgil's poem, and has no pretension to an imitation of that poet, in any one respect. It does not, therefore, deserve the contemptuous and sarcastic notice taken of it, by Gawin Douglas, in the preface to his Scotch translation of Virgil. Caxton's work was dedicated to Arthur, eldest son of Henry VII. He represents himself as at this time well stricken in years: and if the date usually assigned to his birth (1412) be accurate, he must have been seventy-seven years old. The 'Doctrinne of Sapience,' also published in 1489, is the last that bears a date, if we except his edition of the Statutes: a perfect set of these, passed in the reign of Henry VII. till the death of Caxton (1490—1) have very recently been discovered. Twenty-eight of his known publications are without dates. Some of these have been already noticed; a few of the remainder will supply some interesting matter. Caxton printed Chaucer's Canterbury Tales twice; each edition is without date, but the first is supposed to have been one of the earliest productions of his press. Mr. Warton regards it as much more to his honour, than it can be to his discredit, that he printed them very incorrectly. "He probably took the first manuscript that he could procure to print from, and it happened unluckily to be one of the worst in all respects that he could possibly have met with." As soon, however, as he found out these imperfections and errors, he began a second edition "for to satisfy the author, whereas tofore, by ignorance, I had erred in hurting and defamying his boke." Caxton's extreme and conscientious desire to fulfil one of the most important duties of an editor and printer, (and he acted as both,) by giving the works as the author himself wrote them, as well as his candour and ingenuousness, are depicted in a clear and interesting manner, in the preface to his second edition.

He seems to have had a veneration for the memory of this poet, and to have formed, with sound judgment and good taste, a most correct and precise estimate of the peculiar merits of his poetry. As a proof of the former, we may mention, that Caxton, at his own expense, procured a long epitaph to be written in honour of Chaucer. This was inscribed on a tablet, hung on a pillar near the poet's grave in the south aisle of Westminster Abbey. The following remarks will amply justify what we have stated respecting Caxton's ability, fully to understand, and thoroughly to relish, the merits and beauties of Chaucer's poetry.

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* The mercers of London seem to have been great encouragers of literature. Prefixed to Wynkyn de Worde's reprint of Caxton's 'Polichronicon' in 1495, there are a few poetical stanzas, in which one Roger Thoornye, a mercer, is praised for ordering and encouraging the printer to undertake so laborious a performance.

"We ought to give a singular laud unto that noble and great philosopher, Geoffrey Chaucer, the which, for his ornate writings in our tong, may well have the name of a laureate poet. For, to fore that he embellished and ornated and made fair our English, in this royaume was had rude speech and incongrue, as yet it appeareth by old books, which, at this day, ought not to have place, ne be compared among unto his beauteous volumes and ornate writings, of whom he made many books and treatises of many a noble history, as well in metre as in rhyme and prose: and then so craftily made, *that he comprehended his matters in short, quick, and high sentences, eschewing perplexity; casting away the chaff of superfluity, and shewing the picked grain of sentence, uttered by crafty and sugared eloquence.*"

And speaking of Chaucer's 'Book of Fame,' which he also printed, he says, "Which work, as me seemeth, is craftily made and digne to be written and known; for he toucheth in it right great wisdom and subtle understanding; *and so in all his works he excelleth, in mine opinion, all other writers in our English, for he writeth no void words, but all his matter is full of high and quick sentence, to whom ought to be given laud and praise for his noble making and writing.*"

Chaucer's translation of Boethius was also printed by Caxton, without date. It is alternately in Latin and English, but the former is not given entire; a few verses of a period in Latin being succeeded by the whole of the corresponding period in English, and so through the whole volume: the Latin type is large compared with the English.

A curious volume was printed by Caxton, about the period when the French, which had hitherto been spoken almost exclusively at court, was giving place to the English language; it is entitled the 'Book for Travellers.' It contains the corresponding terms in both languages, for those things most commonly talked of at court, especially such as relate to dress.

We have already stated that he continued his labours as a printer to the very last; he seems also to have taken an active part in the affairs of the parish of St. Margaret, Westminster, in which he lived and died; since, for some years before his death, his name appears to the churchwardens' accounts, as one of the parishioners who had undertaken to examine their details. He died in 1490—1, was buried in St. Margaret's, and left some books to that church.

His character may be collected from the account we have given of his labours, and the extracts we have made from his prefaces; he was possessed of good sense and sound judgment; steady, persevering, active, zealous and liberal in his services for that important art which he introduced into this kingdom; labouring not only as a printer, but as translator and editor. It has been objected that he was too much given to admire and print romances; but in this he only partook of the spirit of the age; perhaps, indeed, it survived in him longer and with more power, than in most of his contemporaries; but that his love of romance did not blunt his judgment and taste for real talent is evident by his printing Chaucer's works, and his criticisms on them. It should be recollected, also, that in the selection of works for the press he was necessarily guided by public opinion, and by the probability that what he did print would repay him for his labour and expense. The remarks of Gibbon on this point are sensible and candid. "In the choice of his authors, that liberal and industrious artist was reduced to comply with the vicious taste of his readers, to gratify the nobles with treatises of heraldry, hawking, and the game of chess, and to amuse the popular credulity with romances of fabulous knights, and legends of more fabulous saints. The father of printing expresses a laudable desire to elucidate the history of his country, but instead of publishing the Latin Chronicle of Ralph Higden, he could only venture on the English version by John de Trevisa; and his complaint of the difficulty of finding materials for his own continuation of that work, sufficiently attests, that even the writers which we now possess of the fourteenth and fifteenth centuries, had not yet emerged from the darkness of the cloister." If we reflect, too, on the state of England at this period, that he established his press soon after the murder of Henry VI., and that he carried on his works during the remainder of the reign of Edward IV., and the reigns of Edward V. and Richard III., when the minds of those most likely and able to encourage him were seldom free from alarm for their own safety, their time much occupied, and their means necessarily reduced by the distracted and wasted state of the country; and when little attention or money could be spared for literature; we must give Caxton great credit for having done so much; for having in the midst of confusion persevered in his labours, and succeeded in establishing the art of printing in his native land. That England at this period was much behind France in literature, is proved by the fact that Caxton was obliged to have recourse to the French language for most of the works which he printed. He thus, it may be supposed, employed his press profitably to himself, and certainly with advantage to our literature; for, as Mr. Warton truly observes, "had not the French furnished him those materials, it is not likely that Virgil, Ovid, Cicero, and many other good writers, would, by means of his press, have been circulated in the English tongue, so early as the close of the fifteenth century."

There was, perhaps, at that time, no man in England, whose talents, habits, and character, were so well fitted to introduce and establish the art of printing as those of William Caxton: to have succeeded in this enterprise, the benefits of which, in a national point of view, we may even now be enjoying, is praise enough; for it is the praise of having been a useful citizen of the state and member of society,—the highest that man can bestow or receive.

Caxton's printing is inferior, in many respects, to the printing executed on the continent during the same period. The types employed in the latter have a squareness, fineness, and brilliancy not in those of Caxton; the paper and press-work are much superior; the order and symmetry of the press-work are qualities which appear in very few of his productions. He seems not to have been able to procure, or to have rejected, the roman letter, even after it had been employed with excellent effect by the continental printers. On the other hand, as Mr. Dibdin remarks, "whenever we meet with good copies of his books, his type has a bold and rich effect, which renders their perusal less painful than that of many foreign productions, where the angular sharpness of the letters somewhat dazzles and hurts the eye." His ink is of an inferior quality; his paper is fine and good, resembling the thin vellum on which MSS. were then generally written; his letter is a mixture of secretary and Gothic, also resembling that used in MSS. at that period; his leaves are seldom numbered, his pages never. When the impression was finished, Caxton revised a single copy, and corrected the faults with red ink; the copy thus corrected was then given to a proper person to correct the whole impression; as he was extremely exact, this operation occasioned him much troublesome and minute labour.

CHAPTER VI.

Notices of some other Printers in England, contemporary with Caxton, or immediately after him—Printing introduced into Oxford, Cambridge, St. Alban's, York, Southwark, Tavistock, Ipswich, &c.—into Scotland and Ireland.

PRINTING-PRESSES were set up in England by some foreigners and natives, before Caxton's death. In 1480 and 1481, John Lettou, a foreigner, printed in London. He is said to have come over to this country on Caxton's invitation. This, however, is not likely, as his unskilfulness is such that Caxton would scarcely have invited or encouraged such a bad workman. The types he employed in the only two books he is known to have printed himself, are rude and broken. After he had published them, he was taken into the printing-office of William de Machlinia—first, it is supposed as a journeyman, and afterwards as a partner. Machlinia also was a foreigner; the only celebrity that can attach to the name of these partners, arises from their having printed the first edition of 'Littleton's Tenures,' in a small folio, without date. Their printing-office was near All-Hallows church; their letter, a coarse Gothic one. The partnership was of very short continuance; for, in 1483, Machlinia's name alone appears. Wynkyn de Worde was a man of very superior talents and skill. He was a native of Lorraine, and came into England either along with Caxton, or was afterwards invited by him; he was employed as Caxton's assistant till his death. He continued in his office, as his successor, till between the years 1500 and 1502; when he removed his printing-office to the sign of the Sun, in the parish of St. Bride's, where he died in 1534. Soon after he began business for himself, he greatly improved the art by cutting his own punches, which he sunk into matrices, and casting his own letter. His books are remarkable for their neatness and elegance. Four hundred and eight are known to have been printed by him. His edition of the

'Polychronicon' is deemed uncommonly well executed. Dr. Dibdin calls it "one of the most beautiful folio volumes of that skilful artist:" its date is 1495. Several grammarians of repute, Stanbridge, Garlandea, Whittinton, Holt, and Lilye, lived at the period of the introduction of printing into England; and Wynkyn de Worde, who appears to have been a man of good education as well as talents, printed some of their works. He printed the 'Accidence' of Stanbridge, "in Caxton's house, at Westminster." The date unknown. His 'Vocabulary,' in 1500. This De Worde continued to republish till 1532. The 'Multorum Vocabulorum Equivocorum Interpretatio,' by Garlandea, was printed in 1500, by De Worde, and at least as late as 1517. He also printed repeatedly the grammatical works of Whittinton. Holt's 'Lac Puerorum, or Milk for Children,' was printed by him in 4to, without date. No impression of the grammar of Lilye (but which, in reality, was drawn up by several persons,) by De Worde, or in Lilye's lifetime, has been discovered. The first Greek letters used in England are found in a Grammatical Treatise of Whittinton, by De Worde, in 1519: they are cut out of wood. We have gone into this detailed mention of those works chiefly in order to show the assistance which the press was already giving, in its earliest days, to elementary education. 'Accidences,' 'Lucidaries,' 'Orchards of Words,' 'Promptuaries for Little Children,' were published in great numbers.

Richard Pynson, a Norman by birth, was in Caxton's office. He carried on his business from 1493 to 1531. His known productions are two hundred and ten. He styled himself King's Printer; but it is doubtful whether he had any patent. He introduced the Roman letter into this country. His types are clear and good; but his press-work is hardly equal to that of De Worde. Most of the works he printed are of a higher character for merit and usefulness than those either of Caxton or De Worde. The first treatise on arithmetic, published in this country, was printed by Pynson, in 1522, 4to, 'Libri 4 de arte Supputandi.' It was written by Cuthbert Tonstall, Bishop of London, one of the best mathematicians, as well as general scholars, of his age. In 1499, the first edition of the 'Promptorius Puerorum' came from Pynson's press. He was a voluminous printer of early statutes; and in his time began the publication of what are still called 'Year Books.' Soon after Caxton's death he printed an edition of the 'Canterbury Tales,' and in 1526, reprinted them with a collection of some other pieces of Chaucer. William Jaques was contemporary with Pynson, and printed in conjunction with him the acts passed in 1503. He used a new cut English letter, "equalling, if not excelling, in beauty, any produced by modern foundries." In 1530, the first French and English Dictionary ('Eclaircissemens de la Langue Françoise') was published by John Hawkins. No other work from his press is known.

On the death of Pynson, Thomas Berthelet was appointed King's Printer, by a patent, the earliest that has been found. He dwelt at the sign of Lucretia Romana, Fleet-street. Thomas Godfray was a printer at the same time. These printers embarked in the same concern. From their press came (1532), a complete edition of all that had then come to light of the works of Chaucer. It is on fine paper, and the types and press-work are remarkably neat and elegant. This edition was superintended, and published, under the patronage of William Thynne. To one of this family—perhaps to the same person—Caxton had been indebted for the manuscripts, which enabled him to publish his second and much improved edition of the 'Canterbury Tales.'

If the title of the book (already noticed) purporting to be printed at Oxford, in 1468, be erroneous, as there is strong reason to suspect it to be, then the establishment of printing in this city must have been in 1478. The first known printers there, however, were Theodore Rood, a German, and Thomas Hunt, an Englishman; and their first production Herbert assigns to the year 1485. It is not known in what year printing was introduced into Cambridge. It certainly was very shortly after Caxton established his press in Westminster. The types of the earliest known work which issued from Cambridge, very much resemble Caxton's largest. The first printer at Cambridge, whose name is known, was John Sibert, who is supposed to have been born at Lyons. A few Greek words are interspersed in his edition of Linacre's translation of one of Galen's treatises. This is the earliest appearance of Greek *metal* types.

In 1480, a printing-press was established in the Benedictine Monastery at St. Albans, of which William Wallingford was at that time prior. Wynkyn de Worde informs us that the printer was "sometime a schoolmaster;" and he probably was a monk. The types of the book, which is a Treatise on Rhetoric, in Latin, are very rude. Printing was introduced into York, in 1509, by Hugh Goes, supposed to have been the son of a printer at Antwerp. His first production was the *Pica* of the Cathedral of that city; he afterwards removed to Beverley, and then to London. Peter de Triers, probably a native of that city, printed, in 1514, the first book in Southwark: it was the 'Moral Distichs of Cato,' with Erasmus's 'Scholia,' in Latin, 1525, Tavistock. Here was an exempt monastery, celebrated for its lectures on the Saxon language, which were discontinued about the period of the Reformation. Several of its abbots were learned men: and the encouragement in literature is evident by the establishment of a printing-press a few years after the introduction of printing into England. The first printed book was John Walton's Translation of Boethius de Consolatione, in 4to; the printer's name was Thomas Rychard, monk of that monastery. A book, called the 'Long Grammar,' was printed at Tavistock, but no copy of it has been found. A printing-office was first established in Canterbury about 1525; but no name or date is in the book supposed to have been the first printed there. Cardinal Wolsey, on his visit to do honour to his native city, established or patronised a printing-office at Ipswich in 1538; the printer was John Oswen, who removed to Worcester in 1548, where he published a folio and quarto edition of the New Testament. The art was introduced into Norwich about 1570, by Anthony Solen, one of the many foreigners from the Low Countries who introduced all sorts of woollen manufactures into that city.

Between the year 1471, when Caxton began to print, and the year 1540, the English press, though conducted by industrious, and some of them learned printers, produced very few classics. 'Boethius de Consolatione,' in Latin and English, three editions of 'Æsop,' 'Terence,' the 'Bucolics' of Virgil twice, and 'Tully's Offices,' were the only classics printed. From Cambridge no classical work appeared; and the University of Oxford produced only the first book of 'Cicero's Epistles,' and that at the expense of Wolsey.

The most ancient specimen of Scotch printing known, is a collection entitled 'The Porteus of Nobleness,' Edinburgh, 1508. A patent had been granted by James IV. to Walter Chapman, a merchant of that city, and Andrew Mollar, a workman, for establishing a press there in 1507. Very few works, however, appear to have issued from this or from any other Scotch press for the next thirty years. In 1554, one of Knox's Theological Treatises was printed at Kalykow, or Kelso. Hamilton's, Archbishop of St. Andrews, Catechism, and Treatise on the 'Seven Sacraments,' 4to, was the first book printed at St. Andrews, 1552. It was nearly a century after this, before Aberdeen, the seat of another University, could boast of a press. Edward Raban, who published a poem on the death of Bishop Forbes, in 1635, styles himself "Master Printer,—the first in Aberdeen." Ireland was the last European country, except Russia, (and this, in the sixteenth century, could scarcely be reckoned European,) that received the art of printing. The earliest book known is the Common Prayer, printed in Dublin, 1551, by Humphrey Powell. The Library of Trinity College, in that city, contains but one book printed there, even so early as 1633. The first book in the Irish character, was a Liturgy, 1566, for the use of the Scotch Highlanders.

The advantages which have been derived from the invention of printing, and from the perseverance and ingenuity of those by whom it was established, among whom we may place William Caxton, are vast and important; but they are too obvious to require, in this place, an elaborate detail. The productions of men of genius and learning; the records of literature and of science; of whatever is either brilliant in imagination or profound in thought; whatever may either adorn or improve the human mind,—thenceforth became imperishable. The light of knowledge cannot again be quenched—it is free, and open, and accessible as the air we breathe. The future history of the world may, indeed, disclose enough both of misery and of vice; but it cannot again present an universal blank, or be disgraced by another age of utter and cheerless ignorance.

ADMIRAL BLAKE.

Chapter I.

Birth and Parentage—Academical Education and Pursuits—Acquires great Influence with the Puritan Party—Chosen Member for Bridgewater—Embraces the Cause of the Parliament against Charles I.—Services at Bristol, Lyme, and Taunton.

Few men occupy an important place in the military and naval annals of England, who have more conspicuously exhibited the intellectual and moral qualities which favourably distinguish the character of British seamen than Admiral Blake. Much of the war-like distinction, to attain which this country has made such sacrifices, is attributable to a combination in its inhabitants of active with passive courage; or of daring valour and an ardent spirit of enterprise, with firmness, perseverance, and intrepid endurance. When, to these qualifications can be added, patriotism, disinterestedness, and a correct notion of the due boundaries of obedience and command, little more is wanted to complete the outline of an accomplished English officer. All these requisites were displayed, in an eminent degree, by the individual, a brief sketch of whose life will be attempted in the following pages, who has always ranked high in the estimation of his countrymen, notwithstanding the party bias, so powerfully excited by the political occurrences of the period in which his lot was cast.

Robert Blake was born in August, 1599, at Bridgewater, in the county of Somerset. His father, Humphrey Blake, a respectable merchant of that town, was a branch of the Blakes of Plansfield, in the parish of Spaxton,[*] in its vicinity; a family which bore the rank of respectable country gentlemen. Having amassed a good fortune by the Spanish trade, he bought an estate in the neighbourhood of Bridgewater, where he settled, and had a numerous family. At a proper age, Robert, who was the eldest, attended the Free Grammar School of his native place; whence, at the death of his father, being then of the age of sixteen, he removed himself to Alban's Hall, in the university of Oxford. Here he was noticed for early rising and studious application; which he diversified by the sports of fowling and fishing. As he became too noted a public character, in the sequel, for any sort of traditionary scandal concerning him to escape publicity, it has been asserted that he occasionally amused himself with stealing swans;[*] doubtless in the estimation of those times, nothing more than a species of aquatic poaching. From Alban's Hall, he, after a while, removed himself to Wadham College, where he took the degree of Bachelor of Arts; and in 1619, being then about twenty-one years of age, he became candidate for a Fellowship of Merton College. In this object of his ambition he however failed, owing to the opposition of Sir Henry Savile, then Warden, on the extraordinary ground of not being tall enough. Although it was one of the known foibles of that eminent scholar, to pay a great regard to personal comeliness, there is reason to believe that the religious opinions of the candidate formed the principal cause of his rejection; his family and connexions being, for the most part, inclined to Presbyterianism, or at least opposed to the domineering scheme of church government, which the court and prelacy were then endeavouring to carry into practice. However this might be, his non-attainment of a fellowship probably altered the entire course of his future destiny; for so long a residence at the university, and his wish to obtain that kind of preferment, seem to indicate literary, if not professional views, altogether at variance with his future career. If so, Blake is only one among a multitude of distinguished characters, whom the course of events, rather than premeditation or design, has conducted into that line of exertion, for which their natural endowments have more especially adapted them.

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[*] Lives, English and Foreign, vol. ii. p. 73. Wood's Fasti. Oxon. vol. i. col. 203.

[*] Wood's Fasti, vol. i. col. 203.

Mr. Blake remained at the university until his twenty-fifth year, during which period, according to Lord Clarendon, he obtained as great a portion of learning, as any gentleman of independent prospects, not expressly intended for a learned profession, needs acquire.* This testimony is sufficient to discountenance an insinuation, that he lost the sought for fellowship by want of sufficient erudition; but it at the same time proves that he was never a distinguished student. All that is known of his literary performances, is a copy of verses on the death of the celebrated antiquary Camden, one of those fruits of imitation rather than of native impulse, or genius, which may sometimes be admired as college exercises, but seldom as any thing more. Such, unfortunately, owing to the very mature age to which he arrived before he became distinguished, is all that it has been found possible to collect concerning the early life of Admiral Blake. This is too common a circumstance in biography, to be the subject of particular regret; but it is still to be lamented, as a study of well authenticated accounts of the youthful predispositions of eminent men, is both profitable and amusing. In the great variety and complexity of human character, it may not be always safe to depend upon like results from similar appearances; but in social and intellectual, as well as in physical knowledge, cool and patient observation will gradually account for much apparent diversity. The utility too, as regards education, is undeniable; an early discernment of the indications of future modes of thinking and acting, and a close attention to the formation of habits, being among the most useful qualifications with which all who have to do with the bringing up of youth, whether as parents or teachers, can be endowed.

On quitting the university, Mr. Blake took up his residence at Bridgewater, where he soon became distinguished for soundness of understanding, gravity of deportment, and plain sincerity of temper; all bespeaking the strength and solidity of character which he afterwards displayed. It is, at the same time, recorded that a humorous bluntness of expression rendered him a very entertaining and agreeable companion, notwithstanding the apparent austerity of his manners;† and that, taken altogether, he was admirably adapted to acquire influence with the powerful and rising party to which he was attached both by principle and connexion. It has already been observed, that this party was the Nonconformists, or Puritans, which, from the nature of the times, and the infatuated conduct of the reigning family and its advisers, soon became strongly, although far from universally, tinctured with republicanism. To whatever extent it may be conceded that it was natural for the House of Stuart to claim the same extent of prerogative as its predecessors, it must be allowed by all, except the most prejudiced of its partisans, that the arbitrary system which it adopted, was carried most unwisely into practice. Disgusted, in common with a great portion of the nation, at the measures of the court, and still more annoyed by the severe and intolerant proceedings of Laud, then Bishop of Bath and Wells, the diocese in which he lived, Mr. Blake was the more confirmed in the religious and political opinions, which equally agreed with his own natural seriousness, and the prevalent bias of the inhabitants of his native place. Expressing his sentiments freely, and without concealment, he gradually acquired that influence with his party, which his talents and general respectability were so well calculated to command; so that in 1640 he was chosen Member of Parliament for Bridgewater. This parliament was, however, so soon dissolved, that he had no opportunity of distinguishing himself as a politician; and for the next, which was the memorable Long Parliament, he lost his election.

When in 1642, the differences between the King and the Parliament broke out into actual hostilities, Blake, in common with many of the most active and energetic men of the period, immediately embraced the party of the latter, and raised a troop of dragoons, which he personally commanded as captain. He was at this time in his forty-second year, having attained the meridian of life, before he commenced those warlike pursuits in which he so rapidly acquired a distinguished name. This circumstance, while remarkable in itself, tends in some degree to detract from the interest of this narrative as a piece of biography. It is natural to wish for some satisfactory particulars of the first forty years of the life of a man whose conduct has made the remainder of it celebrated;

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* History of the Rebellion, vol. iii. p. 601. Bates.

† Bates's Elenchus Motuum, p. 228.

but unhappily, except a few scattered notices by Lord Clarendon, Anthony Wood, and Dr. Bates, very little is recorded concerning Blake before he was called into activity by the civil war. The rapidity with which he then acquired eminence as a warrior, both by sea and land, will give a very different complexion to what will follow, his own history, from the period in question, being identified with that of his country. He forms, indeed, one of the most conspicuous examples which modern times have produced, of a man stepping from private life into command, and becoming almost at once a distinguished leader. In the republics of Greece and Rome it was more common, although probably when duly considered less extraordinary, as the institutions of both the Greeks and Romans, in many respects, made every man a soldier. Such was not the case in England during the age of Blake; although the facility with which many of the energetic spirits of the day passed from civil life into active military command, seems to indicate that the temper and construction of British society were not unfavourable to the transition. Or rather, ought we not, as in a more recent period of revolutionary history, to attribute the almost spontaneous appearance of the ability, to the strength of the excitement: and is it not upon the whole consolatory to reflect, that when the souls of men are moved, and their actions dictated by principles, their energies are better seconded by their understandings?

But to return to the narrative: the first opportunity Mr. Blake acquired of distinguishing himself was in 1643, when he served at Bristol under Colonel Fiennes, who intrusted him with the defence of a small fort on the lines. When the governor agreed to surrender that important city to Prince Rupert, on the 26th July, Blake refused to give up his post, and continued to fire upon the Royalists. At this the prince was highly exasperated, and declared, that when he took the place he would hang him. Some friends, however, interfered, and pleaded his inexperience in the usages of war; and, at the same time, urged Blake to refrain from an entirely useless resistance, to which advice, although with great difficulty, he was finally induced to accede.* The conduct of Blake in this respect, so indicative of the spirit and tenacity of the man, has been considered to be, on military principles, irregular; but it should be remembered, that one of the charges against Colonel Fiennes, on his trial before a council of war at St. Alban's, for his conduct at the siege of Bristol, was, that he left Captain Blake in the fort, when he marched out of that city, without giving him any notice of the surrender, or any warrant to deliver up his charge, to the great danger of the lives of Captain Blake and his men.*

Blake subsequently served in Somersetshire as Lieutenant-Colonel of the regiment of foot of Colonel Popham, then in garrison at Lyme, of which town the latter officer was parliamentary governor. Here he acted with so much activity and ability, when the place was besieged by Prince Maurice and Lord Goring, that Popham left its defence entirely to his management; and he so effectually exerted himself, that the Royalists, after being baffled in repeated attempts at storming, and losing a great number of men by the vigorous sallies of the besieged, gave up the attempt and departed.†

His next service was of great importance: Popham's regiment having been raised in Somersetshire, throughout which county Blake was exceedingly popular, he was known and much beloved by all the soldiers who served under him. This attachment was not only highly serviceable to him in the field, but procured him the best intelligence of the state of things around, through the medium of the friends and connexions of his men, all over the county. By these means he acquired intelligence which enabled him, in conjunction with Sir Robert Pye, to surprise Taunton, where they found six cannon and a considerable quantity of ammunition. In 1644, the Parliament appointed him governor of this town, one of the most important in the west of England, being then the only garrison in the parliamentary interest in that part of the country.‡ The works erected in defence of Taunton were far from strong, and the garrison by no means numerous; yet by maintaining a strict discipline, and by treating the inhabitants with consideration and humanity, he managed, with very little assistance from supplies, to retain the place, although repeatedly besieged and blocked up by the King's forces. He had not, indeed, been long there before the Earl of Essex, commanding for the Parliament, was obliged to capitulate in Cornwall, and to surrender his army to the King, an event which was followed by an unresisted scouring of the western counties by the Royalists. Of these troops 3000 ventured to approach Taunton; on which Blake sent out a party from the town, who defeated them with great slaughter, and took several officers of note prisoners. He also cleared all the roads around his post from the armed interruption of a number of cavalier country gentlemen of the vicinity, who frequently behaved with great ferocity to those passengers that were supposed to be adverse to the royal cause.[*]

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* Hist. of the Rebellion, vol. iii. p. 602.

* Howell's State Trials, 224, 252.

† Lives English and Foreign, vol. iii.

‡ Rushworth's Hist. Collections, vol. v. p. 685.

Annoyed by this activity, Lord Goring came into the neighbourhood of Taunton with a body of Royalists, amounting to 10,000 men; and pressed the works so closely, that he made a breach in the line of defence, and took actual possession of a part of the town. Blake however, still contrived to retain the castle and the remainder of the town, although in the greatest distress both for ammunition and provisions. Aware of this fact, the besiegers summoned him to surrender, the message being conveyed to him by Colonel Windham, governor of Bridgewater, for the King, who happened to be at that time with the royal army. The first summons demanded instant surrender, on pain of fire and sword; which being treated with disregard, Windham, who had been on intimate terms with Blake, mildly endeavoured to persuade him to spare an unnecessary effusion of Christian blood. To these repeated demands Blake at length made the following characteristic reply:—

"These are to let you know, that as we neither fear your menaces nor accept your proffers, so we wish you for the time to come to desist from all overtures of the like nature to us, who are resolved, to the last drop of our blood, to maintain the quarrel we have undertaken; and doubt not that the same God who has hitherto protected us, will ere long bless us with an issue answerable to the justice of our cause. However, to him alone, we shall stand or fall."[†]

Soon after the despatch of this letter, a body of parliamentary troops broke through the besieging force, and supplied the town with provisions and other necessaries. The main army of the Parliament could not however move so rapidly to the relief of Taunton as the situation of the governor and garrison required, owing to the time necessary for the re-officering it under the famous self-denying ordinance.[*] Before, therefore, effective succour arrived, the besiegers had destroyed the suburbs and half the town, and Blake could with difficulty maintain even the castle. At length Major General Skippon was directed to join Sir Thomas Fairfax, and march to the aid of Blake with 8,000 men, and a train of artillery, and money and provisions were sent after them.

In the mean time, fully acquainted with the great distress of the garrison, the besiegers sent another summons to Blake to surrender, to which he briefly replied, that he would eat his boots first. He then calmly proceeded to barricade the part of the town which he still retained with all sorts of lumber; and made the Royalists pay dearly for every step of ground that they acquired. At last, Lord Goring and Prince Rupert were called away, with part of the besieging force, to the king's relief at Oxford; but the approaching army of Sir Thomas Fairfax and General Skippon being diverted to the same scene of hostilities, a strong detachment only, under the command of the Colonels Weldon and Greaves, could be spared for the relief of Taunton. This force, however, proved sufficient for the service; and on the 11th of May 1645, the Royalists were obliged to raise the siege, after they had lost 1000 men, and sent away twelve waggon loads of wounded. For this spirited defence, the parliament voted a letter of thanks to Colonel Blake, with a donation of 500*l.*, and 2000*l.* to be distributed among the garrison. A general collection was also made to restore the houses destroyed during the siege.

The possession of Taunton, by the Parliamentarians, proved so injurious to the royal cause, that another attempt was soon after made to take it, by the united forces of Lord Goring, Sir Richard

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[*] Sir Francis Doddington meeting a divine, exclaimed, "Who art thou for, priest?" "For God and his gospel," he replied; which answer being deemed a declaration for the Parliament, Sir Francis shot him dead upon the spot.—*Lives English and Foreign.*

[†] Lives English and Foreign, vol. ii. p. 81, 82.

[*] An act passed through the intrigues of Cromwell and the Independents, by which all members of Parliament were to abstain from military command, except Cromwell himself, a scheme to get the army into the hands of his own partizans, and to exclude the Presbyterian and other leaders of reputation from acquiring influence with the soldiery.

Greenville, and Colonel Berkely. They suffered much from the spirited sallies of the besieged, under the command of Colonel Weldon; and when the latter, on one occasion, was nearly surrounded by the enemy, Blake marched out to his relief at the head of two troops of horse, and charged the cavaliers so fiercely, that Weldon was enabled to gain the town, into which Blake and his party followed in good order. On learning the renewed attempt upon Taunton, the city of London voluntarily granted 4000*l.* to raise and equip 1000 horse, to be sent to the assistance of the governor, under the command of Major-General Massey; and the committee of Kent supplied two troops of dragoons, and two companies of infantry, for the same service. The distress of the garrison, during these preparations, was very great; but although Blake could acquire no precise information when succour might be expected, he resolutely held out, and continued to annoy the enemy with great effect, until the junction of the parliamentary forces, under General Massey and Sir Thomas Fairfax, once more obliged Lord Goring to raise the siege.*

It has been necessary to dwell at some length on this obstinate defence of Taunton, for two reasons: in the first place, to show the rapid developement of Blake's talents as a commander; and in the second, because this protracted occupation of a large portion of the king's troops, materially tended to hasten the final defeat of the royal cause. It was the known distress of Blake in Taunton, and a supposition that, if pressed, he must surrender in a few days, that induced the king to divide his forces, and thereby hasten the decisive battle of Naseby, which Fairfax would not have risked, had the royal army remained entire. At the same time, the large body of troops despatched on this service, not only completely failed to accomplish its object, but, in the sequel, was routed and dispersed altogether. It seldom happens that a single, and apparently a mere subordinate military exertion, leads to consequences so important.†

After refreshing and recruiting his garrison, Blake marched with a party of his men, and captured Dunster Castle, held by the Luttrell family for the crown. This event, which was one of the last transactions of the war, took place in April 1646, when he returned in triumph to Taunton, and to the enjoyment of a considerable interval of repose.

It has already been seen how promptly Colonel Blake espoused the side of the parliament, in a contest rendered equally inevitable by the progress of opinion among the people, and by the too natural blindness of authority to the necessity of yielding, more or less, to a decided change in national sentiment. Without entering into the question of the practice of their predecessors, the religion and government of James I. and Charles I., no matter whether adopted or inherited, were essentially intolerant and arbitrary. What is equally undeniable, principles in respect to both were ostentatiously promulgated, at a period not only when the common sense of mankind began very generally to revolt at them, but when the rising power of the popular branch of the constitution, and the diversity of religious opinion, rendered their establishment as impracticable as unpalatable. This weakness necessarily threw all the strong and sturdy spirits, most opposed to indefinite prerogative and ecclesiastical intolerance, into the opposite extreme of republicanism. But it was not monarchy and episcopacy simply, as such, that the more disinterested and well principled of these opposed in the first instance; but monarchy and episcopacy as defined by the court and high church party.* The mischievous doctrines of passive obedience and divine right, which will always prove snares and pitfalls to sovereigns, who are misguided enough to govern as if they believed in them, were every day maintained, not merely as favourable, but essential to the English constitution. The history of the country, since that period, has happily proved, that a crown requires the diffusion of no such principles for its due support. Grant, indeed, as was then demanded, a dispensing power or privilege of suspending the authority of the law, the right to raise taxes without the consent of parliament, and the liberty to prosecute for difference of religious opinions, and claim, at the same time, passive obedience from the people;and what but arbitrary government can ensue? The obstinate claims of this description, on the part of Charles I. and his advisers, should always be borne in mind, in judging of the conduct and motives of men so undeniably disinterested and honourable as Blake; for it was not surprising that individuals of that class, who conscientiously maintained the religious tenets so undisguisedly assailed, should pass over limited monarchy, in their theoretical march to political liberty. It may be said that these observations will only apply to the first part of the reign of Charles I.: it may be so, to a certain degree; but the conduct of the family, when restored, too powerfully justified the distrust always entertained of it by those who were convinced that it would never willingly govern under the restraint of a well-regulated constitutional system, or sincerely give up the dangerous pretensions which its final expulsion alone terminated.

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* Lives English and Foreign, vol. ii. p. 85.

† Rushworth's Hist. Coll. vol. vi. p. 28.

* The struggle no doubt rapidly became one for ascendancy on both sides; the too frequent consequence of appeals to arms to settle civil and religious differences. That which might be *equality* if bestowed, usually becomes *ascendancy*, when fought for.

It was doubtless under the impulse of convictions, more or less akin to those alluded to, that Blake chose his party on the commencement of the disastrous conflict; and it is therefore highly to his credit and consistency, that he took no share in any of the measures which gradually changed the complexion of a contest for civil and religious liberty, into a struggle for personal interest and ambitious aggrandisement. Thus, for some time after the relief of Taunton, he took little part in public business, disliking the proceedings of the Independents and the army; and the expulsion of the Presbyterians. Nor, though inclined to a commonwealth, did he approve of the trial of Charles I., the execution of whom he deemed barbarous and illegal. He even went so far as to assert "that he would as freely venture his life to save the king, as he had done to serve the Parliament.* But, however much opposed to the arbitrary and vindictive measures against the life of the king, Blake seems entirely to have given up all hopes of agreement with Charles, after his refusal to accept the terms proposed to him while with the Scottish army. He had therefore joined the borough of Taunton in a petition to the House of Commons, never again to address the king; but he was invariably averse to any stronger measure than his deposition. His disapprobation of harsher proceedings indeed, was so well understood by Cromwell, that, when the trial of the king was determined upon, a part of the forces, under Blake, was disbanded; and, to conceal the motive, the order was accompanied with a parliamentary compliment, and a donation of 500*l.* This aversion to every thing sanguinary, out of the field, was conspicuous in the whole of his conduct; and it forms the brightest part of his brilliant character that in all parleys and negotiations with the royalists, and especially in the treatment of the vanquished, he was invariably feeling and considerate. This humane disposition, added to the fact, that the whole of his career was rather that of an open and honourable warrior, than of an interested politician, has rendered him comparatively a favourite, even with the royalists. No man on the parliamentary side has been treated so tenderly by the numerous vindicators of Charles I., as Blake; owing partly, no doubt, to so many of his subsequent exploits, redounding to the honour of the country; but also, in no mean degree, to the frank and sincere character of the man.

But although personally averse to the trial and condemnation of the king, having strongly imbibed republican sentiments, Blake had no objection to the abolition of kingly government, and therefore after the unfortunate monarch's execution, he quickly fell in with the views of the prevailing party; and next to Cromwell, and possibly Ireton, was considered to be one of the most able and efficient officers of the commonwealth. Unlike the former leader, although doubtless anxious for glory, his services were no other way connected with views of self aggrandisement; and he seems to have aspired rather to be useful to his country, within the sphere of his acknowledged abilities, than to sway either as a legislator or politician. It has been alleged, and most probably with justice, that he formally adopted the principle, common to several of the most virtuous public characters of Greece and Rome, that it was a duty to serve his country under all circumstances; and he seems to have satisfied himself in the various changes of the times, by adhering to what he deemed its true interests. It is one of the unavoidable results of this line of conduct, that it renders honourable men occasionally subservient to the more interested views and purposes of others; and in this manner, the exertions of Blake were made conducive to the advancement of Cromwell. He was not, however, such a man as that wily politician wished to have in his councils, and it is therefore conjectured, that his destination, which was from this time exclusively to the sea service, originated in Cromwell's anxiety to employ him where his talents would at once be efficient for the country, and powerless for the acquirement of any influence that might be directed against himself. Whether this supposition be justly founded or not, the well-judged appropriation of Blake to the navy, led to consequences of no small moment in the naval history of Great Britain.

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* Lives, English and Foreign, vol. ii. p. 85.

CHAPTER II.

Union of Military and Naval Command—Blake, Deane, and Popham appointed Commissioners of the Navy—Blake ordered to pursue the Fleet under Prince Rupert—Transactions in the Tagus—War with Portugal—Proceedings at Carthagena and Malaga—Defeat of Prince Rupert—Reprisals on France—Blake's Treatment of a French Captain—Services against the Isles of Scilly and Guernsey—Causes of War with the Dutch—First Engagement with Van Tromp—Expedition to the North.

FOR nearly a century and a half, the naval service of Great Britain has been rendered so strictly nautical, that the appointment of a soldier, nearly fifty years of age, to the command of a fleet, will be deemed extraordinary by those who are unacquainted with the progress of our maritime power towards its present superiority. In the reign of Elizabeth, such were the circumstances of the period, that men of great maritime experience were necessarily called into naval service; as for instance, Hawkins, Drake, Frobisher, and others; none of whom had been originally officers of the navy in the present sense of the term. In the same manner, the conduct of the fleet was often given to any nobleman, or officer possessed of general abilities for command; and this continued to be the case until towards the close of the reign of Charles II. During the Commonwealth, indeed, nearly all the most distinguished naval commanders had previously served in the army; although from the comparative perfection to which naval tactics have since been brought, and from the seamanship required in the manœuvres, on which they entirely depend, the conduct of a sea engagement, by a landsman, would, naturally enough, at this time be condemned as a very hazardous experiment. There was nothing, therefore, remarkable in the appointment of an officer of the talents and energy of Blake to the sea service: the genuine ground of surprise is, that he at once became the most able and successful naval commander of his day; but, promptness, decision, intrepidity, and enterprise, must at all times, form the chief ingredients of naval as well as of military heroism.

On the 12th February, 1649, the Colonels Blake, Deane, and Popham were appointed commissioners of the navy, and Blake himself was nominated to the command of a squadron, and ordered to sail in pursuit of the Princes Rupert and Maurice, who were in the Irish sea with that part of the fleet which had adhered to the king, and which was endeavouring to assist the Marquis of Ormond, then in arms for Charles II. in Ireland. Blake arrived with his fleet off Kinsale, in the following June, where the two princes lay in harbour. At the same time, Deane cruised off Plymouth, Popham between the Downs and Portsmouth, and Sir George Ayscue in the Bay of Dublin; by which several squadrons, the Parliament became completely masters of the sea. Such was the popularity of Blake, whom henceforward we shall call Admiral,* that the crews of the ships of Prince Rupert deserted to him daily, which induced the prince to execute ten seamen whom he detected in the attempt. Blake kept the royal ships blockaded until the following October, when despairing of relief by sea, and Cromwell being about to capture the town by land, Rupert and Maurice resolved to force their way through the blockading squadron, which, with the loss of three ships, sunk by Blake, they effected, and steered for Lisbon. Here they were kindly received, and sheltered by the King of Portugal; a duty of hospitality scarcely to be evaded by a monarch who had been in strict alliance with Charles I.

Blake rapidly followed the two princes

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* He is indifferently called General or Admiral, in the original authorities: it has been thought better in the subsequent narrative, to adhere to the official designation which, in modern estimation, will be deemed most appropriate.

to the mouth of the Tagus, and by order of the Parliament demanded the ships of Prince Rupert, as belonging to the Commonwealth of England. This requisition extremely embarrassed the Portuguese Cabinet; as policy exacted a compliance, while honour and hospitality dictated a refusal. The latter in this instance prevailed; and as the Portuguese had reason, from the spirit and promptitude of Parliament, to anticipate immediate war, a squadron of thirteen Portuguese ships was rapidly equipped by them to join that of Prince Rupert and to attack the English, anywhere between the two capes of Finisterre and St. Vincent, that it might appear the King of Portugal sought only to secure his own coasts.

Aware of the above junction, Blake and his squadron sailed away; soon after which he was joined by another under Popham, when (in October, 1650) they fell in with a Portuguese fleet of twenty-three sail, richly laden and bound from Brazil for Lisbon. Of these they captured twelve, containing 10,000 casks of sugar, and burnt three; when finding themselves in want of stores, they sailed for England with their prizes. The coast being thus clear, Prince Rupert, after having involved the King of Portugal in an embarrassing war with the Commonwealth, quitted the Tagus, and proceeded to Carthagena. He was quickly followed by Blake, who in his way homewards having fallen in with five transports on their passage to him with provisions and stores, immediately returned to the pursuit of the royal squadron. On his arrival at Carthagena, he came to an anchor before the fort, and announced that he was sent by the Commonwealth to pursue the enemy who had taken shelter there; and, the King of Spain being in amity with England, he requested either that the fleet might be given up to him, or that he might be permitted to attack it. A refusal, on similar grounds to those alleged by the King of Portugal, was given; but on being further pressed, a promise was made by the Commandant to send for orders to Madrid. Blake, not thinking the prince would venture out, proceeded on a cruise, on which Rupert, with the ships under him, left Carthagena, and went into Malaga, where he was so ill advised as to sink and capture some English merchantmen. Informed of this transaction, Blake sailed immediately for Malaga, where he arrived in January 1651, and regarding the manner in which the prince had been allowed to act as dispensing with all ceremony, he attacked the royal squadron without reference to the Spanish authorities, and burnt or destroyed all but four or five ships, with which the two princes escaped to the West Indies, and supported themselves by capturing English and Spanish merchantmen. At length, Prince Maurice was cast away, and Rupert contrived with two or three ships to return to France, where he sold them with his prizes, on behalf of Charles II., to the French government. Such was the fate of a fleet of twenty-five finely-equipped ships, which on the execution of Charles I. had declared in favour of his son.*

A sort of equivocal warfare existed at this time, between the Commonwealth and France, brought on by the secret encouragement of French privateering, which proved very injurious to English commerce. Reprisals having been ordered, Blake had captured a French man-of-war of great value, previously to his first engagement with Prince Rupert. Soon after that victory, he fell in with another of forty guns, the commander of which, not apprized of the war between the two countries, was invited to visit the ship of Admiral Blake. He accepted the invitation without suspicion, and when he came on board he was informed of the war by the Admiral, who asked him if he would willingly resign his sword. The Frenchman spiritedly answered, No! on which, detesting all appearance of treachery, Blake told him to return to his ship, and fight it as long as he could, which he bravely did for two hours, and then surrendered.† This species of gallantry is attended with too great a carelessness of human life, to entitle it to the full acquiescence of reason and humanity; but it is highly characteristic of a frank and fearless nature, disdaining all advantages not obtained in an open and honourable manner. Not long after this exploit, the Admiral sailed for Plymouth, and on his arrival received the thanks of Parliament, and was appointed Warden of the Cinque Ports. His return to England took place in February, 1651; and in the following month an Act passed to make Blake, Deane, and Popham, or any two of them, Admirals and Generals of the Fleet, for the year ensuing.

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* Life of Prince Rupert. Heath's Chronicle of Civil Wars, p. 275. Wood's Fasti. Oxon. vol. ii. col. 201.

† Life of Blake, in Gent. Mag., by Dr. Johnson.

The next service intrusted to this able commander was the reduction of the Isles of Scilly, which still held out for the king. These islands not only afforded shelter for privateers, but it had been discovered that the Dutch were forming views upon them, and had despatched Admiral Van Tromp and a squadron of twelve ships of war, with instructions either to purchase or reduce them. On the arrival of Blake, with a body of eight hundred troops on board, Sir John Greenville, who commanded for the king, after some little resistance submitted upon terms; and retired to Guernsey, which had also been preserved for Charles II. by Sir George Carteret, aided by a garrison of four thousand men. The reduction of this island was forthwith undertaken by Blake, assisted by a strong body of troops commanded by Colonel Haynes. They reached Guernsey in October, 1651, but the defence was so spirited, that in spite of the most active exertions both by the squadron and troops, the various forts could not be mastered until the following January, when the Governor capitulated, and was treated by the Admiral with all the respect due to his bravery and honourable character.* For these services, the two Commanders were thanked by the House of Commons. It was during this stay of Blake before Guernsey, that he was appointed one of the Council of State for the ensuing year. The schemes of Cromwell were now reaching maturity, and he felt all the value of the support of such an able officer and national favourite.

The following year, Blake was constituted sole Admiral for nine months, in the prospect of a Dutch war; and here a period of the naval history of England and Holland commences, which, while it strongly exhibits the spirit and energy of the people of both countries, affords a melancholy proof of the barren and futile nature of much of the warfare which has distracted the world. The enmity between the English and Dutch at this period, originated principally in commercial and maritime rivalry, directed in each state to party and personal purposes. It is difficult now to ascertain which of the governments was the first aggressor; but there is no doubt that both were grievously to blame and that the hostilities which followed exhausted and weakened both sides, without proving in any essential respect serviceable to either. Hitherto indeed national emulation has been but another name for national enmity; but are there not some signs to show that a gradual improvement is taking place? And though it would be too sanguine to expect that powerful states will soon cease to be dangerous to their weaker neighbours, is it too much to anticipate, that with the increasing diffusion of knowledge, the gratification of mere personal ambition will be restrained; and that all those fancied necessities for war, which originate in mistaken views of political expediency, will yield to more enlightened principles, and more humane feelings? Highly indebted as were the United Provinces to the policy of Queen Elizabeth, for their emancipation from the intolerable yoke of Spain, the perpetually recurring stimulus of mercantile rivalry gradually overcame the recollection of those eminent services; especially as it was easy to interpret them into a political interference, which, considering the designs of Spain against England, it was as expedient for the latter to grant, as for the United Provinces to accept. Whatever the reason, their rapid growth into a maritime and commercial power was accompanied by envy of all correspondent advancement, on the part of a nation so admirably situated for the acquirement of that kind of superiority as Great Britain. This was exhibited in various ways during the reign of James I., whose anxiety for a close alliance with their formidable enemy, Spain, had still further excited their jealousy. Charles I. also obliged them to pay for a license for the right of herring fishing on the British coast, which claim, however reasonable, they resented, and resisted to the utmost of their power. The subsequent marriage of the Princess Mary, eldest daughter of Charles, with the Prince of Orange, likewise formed a strong party against the English Commonwealth, and (after the execution of that prince) in favour of Charles II.; a circumstance of itself quite sufficient to produce a disposition to war on the part of the English rulers.

Thus, on the death of Charles I. in 1649, satisfied that no molestation would ensue from France or Spain, the attention of the Independent leaders was drawn strongly towards the United Provinces, the strength of whose navy might render their espousal of the cause of the exiled king a source of considerable annoyance. Under these impressions, therefore, they sent Dr. Dorislaus, a civilian of Leyden, who had been naturalized in England, to the Hague, in order to produce a good understanding between the two republics; but unfortunately, he was assassinated by some Scottish royalists in that town the very evening of his arrival.* A suspected connivance at the escape of the murderers, produced a considerable sensation in England; but as the Parliament wished to form an alliance with the United Provinces, and as the death of the Prince of Orange afforded a favourable opportunity, the assassination of Dorislaus produced no interruption of these overtures, and in March, 1651, Oliver St. John, and Walter Strickland, were sent to the Hague, in the place of Dorislaus, to complete a treaty of union. This negotiation altogether failed, owing, as the Dutch writers affirm, to the unreasonable conditions insisted upon by the English; but more probably in consequence of an opinion that the affairs of Charles II. were not entirely hopeless, he being about to head his final expedition into Scotland, whither, indeed, the states themselves conveyed him. The Orange party was also strongly against any alliance which might defeat the future ascendancy of the infant prince; and thus the English envoys returned, not only disappointed, but incensed at the insults they had received from the common people at the Hague. No notice of this was however taken, until after the battle of Worcester, and the success of Monk in Scotland, which left the English government at leisure to follow the dictates of its resentment. The mere gratification of revenge, in a national sense, being a poor motive for war, it has been thought that the enemies of Cromwell sought to promote it, in hopes that such great expenses at sea might lead to the reduction of the army, which was visibly conducting him to the summit of power on land. On the other side, it has been argued, that Cromwell himself promoted the war in order to retain the very army it was thus proposed to reduce; which contradiction only proves that nothing is more vague and inconsistent than conjectures respecting the designs of artful politicians. The real state of the case probably was, that Cromwell deemed it necessary to lower the naval predominance of the Dutch; and to defeat their grasping endeavours at a commercial monopoly. The latter of these objects was still more effectually promoted by the celebrated Navigation Act, which prohibited the importation of all foreign commodities, except in English bottoms, or in those of the country where the goods were produced. By this Act, which took place the first of December, 1651, the parliament quietly transferred a large share of the carrying trade from the Dutch shipping to that of Great Britain, and effected a most serious blow by an apparently simple and domestic regulation.* Parliament also granted letters of marque to those merchants, who complained of Dutch aggression, so that it soon became evident to the government of the United Provinces that war was resolved upon.

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* Hist. of Rebellion, vol. iii. p. 265.

The conflicting authorities of the English and Dutch historians, leave it doubtful to this day which of the countries was really most anxious for war; for there is much plausible evidence to show, that jealous of the rising spirit and energy of the English Commonwealth, the Dutch were resolved to strike a blow that might cripple its navy and lessen its increasing reputation. But whatever was the real inclination, on either side, as if conscious that it could scarcely be vindicated, each party was solicitous to throw the odium of commencing the war upon the other. On the passing of the Navigation Act, therefore, the Dutch sent an embassy to London, which was received with great apparent respect; but instead of a revocation of the Act complained of, the Dutch ambassadors encountered a formidable recapitulation of all the injuries received from the United Provinces, at Amboyna, in India, Persia, Muscovy, Greenland, and other places, for the last thirty years, terminating with a demand of 1,700,000*l.* by way of reparation. The murder of Dorislaus was also adverted to; and satisfaction required for the omission of all steps against the assassins. On compliance with these claims, an alliance with the United Provinces was gravely proffered as before. These demands produced no surprise, for so little expectation had been formed of any pacific result from the negotiation, that the Dutch had been getting a fleet of one hundred and fifty ships of war ready for sea, during the absence of their ambassadors; and it now became certain that the first encounter of the respective national fleets, would terminate in direct hostilities.*

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* Hist. of the Rebellion, vol. iii. p. 229.

* The policy and expediency of this measure were as evident at the time, as the necessity of some relaxation has been since. Possibly one of the most useful accomplishments for a modern politician is the art of discovering, when that which was once wise is wise no longer.

More space has been occupied in giving a due notion of the circumstances which led to the Dutch war, than usually belongs to the detail of historical events in biography, because it was desirable to exhibit the state of national feeling at the period when hostilities commenced. The nature of the rivalry with the Dutch came close home to the bosoms of a trading people; the pretensions of their navy must have still more forcibly assailed the pride and spirit of the seamen of a country, whose insular situation and previous exploits had marked it out for naval dominion. Blake was precisely a man to feel this stimulus in the highest possible degree; not to mention the strong republican notions of national glory, which he appears, in common with many other distinguished men of the day, to have owed to his classical studies. It was the great defect of Greek and Roman patriotism, that it would too frequently sacrifice not only justice, but the public interest, to advance the public glory. There is little reason to complain of Admiral Blake on this score; but it doubtless tended to conduct him to that general conclusion, which, in all the changes of the times, he continually impressed on his officers and seamen. "It is our duty," said he, "to defend the country, into whatever hands the government may fall;" or in still more characteristic phraseology, "under all circumstances, to prevent the foreigners from fooling us."

The ambassadors of the United Provinces were still in London, when a Dutch fleet of forty-five sail appeared in the Channel, under the command of Admiral Van Tromp, acknowledged to be one of the bravest and most experienced sea officers in Europe. The pretended object of this squadron was to convoy some merchantmen; but it most unnecessarily anchored in Dover Roads, and from the circumstances which followed, apparently with a design to provoke hostilities. A small squadron of eight ships being then in the Downs, under the command of Major, afterwards Rear Admiral Bourne, that officer sent to know the reason of this unusual demonstration. Van Tromp pleaded stress of weather; which excuse being evidently untrue, Blake was ordered to the Downs, with such ships as were ready. On the appearance of the English fleet, Van Tromp weighed anchor, and bore up to it nearer than was necessary, and that too without striking his flag—the mark of homage which had always been paid to England in the narrow seas. To remind him of the expected salute, Blake fired a gun without ball; on which Van Tromp is said to have also fired a single gun on the contrary side, as if in derision. Blake fired a second, and then a third gun, on which Van Tromp answered with a broadside. Perceiving that it was the intention of the Dutch to fight, Blake advanced with his own ship, to discuss with Van Tromp the point of honour, and by explanation to spare the effusion of blood; but the latter cut short all negotiation, by firing a broadside into the English Admiral's ship, which, it is said, shattered his cabin windows. Blake was extremely incensed at this insult, and quickly ordered his men to answer the Dutch Admiral in his own way; but his anger evaporated in a somewhat coarse sea joke, "he took it very ill of Van Tromp that he should take his ship for a brothel, and break his windows." Blake singly sustained the brunt of the attack, until the remainder of his fleet and the squadron of Major Bourne could join him, when the fight became general, and lasted from 5 o'clock until night. In this engagement, which took place on the 19th of May 1652, the Dutch, notwithstanding their numerical superiority, appear to have lost two ships; and the advantage, although not otherwise of much moment, was decidedly in favour of the English.*

As each of the admirals had been directed, if possible, to place the blame of commencing hostilities upon the other, Van Tromp, in his official despatch positively asserts, that he backed his sails and lowered his flag to the British Admiral, who nevertheless fired the first broadside, and wounded several of his crew;* while, on the other hand, Blake's letter as expressly states the contrary. It is difficult to doubt the assertion of an individual so personally honourable as Blake; and it appears that his conduct was fully justified by a report from the Council of State at home, as well as by the popular feeling, which was so much irritated, that it became necessary to grant a guard to the Dutch ambassadors, who attributed the engagement to accident and misconception on both sides. The States sent another envoy, ostensibly to effect a pacification; but the parliament persisting in the same high tone as before, the United Provinces at last recalled their ambassadors, and prepared for a continuation of the war. Both sides issued manifestoes on this occasion; the Dutch to demonstrate that they were attacked without provocation, and the parliament to recapitulate the preceding grievances, to which was now to be added the refusal to strike the flag. To this demand the States had pleaded, that although the Republic, in its infancy, had paid that compliment to the *royal* dignity of England, they did not hold it due to the Commonwealth. A more indiscreet plea could scarcely have been advanced, to men of the character of those who then ruled the destinies of England; and accordingly it was determined to maintain the national honour at all hazards. "But after all," continues Rapin, with great simplicity, or rather with that conventional language, which it is so usual to apply to commonplace political falsities, "this was by no means the true ground of the war; but these manifestoes were *necessary* to vindicate the rulers of both Republics, and to impose a belief on the subjects, that they were not plunged into these extraordinary expenses to support a war, without the most evident necessity."† That is to say, the people were to be deluded into the supposition of a necessity which did not actually exist. It is gratifying to feel assured that this species of delusion, at least, becomes every day more impracticable; and that it is only necessary for the people to be thoroughly convinced of the atrocity as well as folly of war undertaken upon any but the most solid grounds, to render it wholly impossible.

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* Rapin's Hist. of England, 8vo. edit. vol. xi. p. 60. Campbell's Lives of the Admirals, vol. ii.

* Heath's Chronicle, p. 319. Lives, English and Foreign, vol. ii. p. 99.

The fleet of Blake was rapidly reinforced by the personal exertions of Cromwell and Bond, who repaired to Dover to consult with him on the subject. Some time elapsed before it was in a condition to meet that of the Dutch, which soon amounted to seventy sail; so vigorous were the exertions of those Republicans to obtain a naval superiority over the English. In about a month, Blake deemed himself strong enough to meet the enemy; and, aware of the arduous nature of the expected conflict, he proclaimed a solemn fast and day of humiliation, which both officers and seamen were called upon to observe. The two main fleets, however, did not encounter each other so soon as was expected; and in the mean time, the admiral most effectually exerted himself to annoy the Dutch trade. He then sailed with a strong squadron northward, and in less than a month, captured thirteen Dutch ships of war, being the whole of their Herring convoy. With great and considerate humanity, however, he did not destroy the fishing vessels, but only claimed the tenth Herring, the former tax, for the liberty of fishing on the British coast; nobly declaring his reluctance to waste so much food, to the probable hunger and distress of thousands.*

Chapter III.

Return from the North—Engagement with and Defeat of De Witt and De Ruyter—Exertions on both sides—A great Force placed under the Command of Van Tromp—Inferiority of the English Fleet under Blake—Result of the ensuing Engagement—Vain Glory of Van Tromp—Quick Recovery of Superiority by the English—Series of Engagements with the Dutch—Behaviour of Blake and his Colleagues on the turning out of the Long Parliament—Cromwell assumes the Protectorate—Peace with the Dutch.

Blake returned from the north with his prizes, and 900 prisoners; and reached the Downs on the 12th of August, 1652, where he was joined by several more ships; and his fleet being now sufficiently strong, he steered over to the Dutch coast. During this cruise he fell in with a French squadron, proceeding to the relief of Dunkirk, and on account of some hostile proceedings at Newfoundland; he captured and carried it into Dover, by which means the former town fell into the hands of the Spaniards. On the 28th of the following month, of September, he met the Dutch fleet, under the command of De Ruyter and De Witt, who, in consequence of the popular dissatisfaction with Van Tromp, in Holland, had succeeded that officer. When Blake discovered the Dutch, he had but three of his ships with him, Vice Admiral Penn's squadron being at some distance; and the remainder of the fleet a league or two astern. He, however, bravely bore in among them, and being soon admirably seconded by the divisions under Penn and Rear Admiral Bourne, the fight began with great animation; and lasted until night, by which time the Dutch saw their Rear Admiral captured, and three other ships destroyed. Blake would have renewed the fight the next day, but the Dutch made all the sail in their power, and reached Goree. The English lost but few men, and not one ship, while the Dutch fleet landed more than 2000 wounded; the disadvantage, according to De Witt, being caused by the cowardice, or disaffection of his captains, irritated by a great arrear of pay and the unprofitable nature of the contest[*].

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* La Vie de Tromp, p. 17.

† Rapin's Hist. of England, vol. xi. p. 62.

* Lives English and Foreign, vol. ii. p. 101. Campbell's Lives of the Admirals, vol. vi.

The impolicy of such a war, on the part of a commercial people like the Dutch, was by this time apparent; for Blake, with his usual activity, had made use of his success, so as to annoy their trade in all quarters. The ill humour created by their losses vented itself with great asperity upon De Witt, who was in another way unpopular, from his republican opposition to the ascendancy of the House of Orange. On his return to Flushing, a tumult ensued; and so much disappointment was expressed, that De Ruyter was anxious to resign his commission, and De Witt took to his bed from pure chagrin. Considerable pains were taken by the States to remedy the late disasters; commissioners were appointed to inquire into the conduct of the offending captains; and the fleet being refitted, was once more put under the command of Van Tromp. The English, on their side, were equally active; an act was passed by the Parliament, requiring all English seamen to return home in forty days, and such as were in India in twelve months: it also directed that all English carpenters, shipwrights, and other efficient artisans found on board the enemy's ships, should be thrown overboard without mercy. In point of fact, the war was essentially injurious to both countries; except upon that inhuman theory, which holds occasional warfare to be necessary as a species of exercise, and national prosperity to rest securely on established ascendancy alone. Were the power of self-preservation exclusively implied by this doctrine, it might be difficult to controvert it; but unhappily ascendancy in all its guises is disposed to be aggressive, and the power to oppress is almost invariably followed by the inclination. It must, however, be admitted, that the welfare of Great Britain is so intimately connected with naval superiority, that it is difficult altogether to condemn a course of proceedings which has materially conduced to it. Such was certainly the case with this otherwise profitless warfare. Whatever may now be thought of the motives on both sides, the merit of Blake will remain the same: if the contest was necessary, he carried it on with triumphant vigour, and ultimate success; and even if impolitic, he still rendered it as beneficial as it could be made, by the energy and spirit which he infused into the sea service, and the manner in which he made it redound to the honour of the English name.

Nothing is more remarkable during this war, than the transient superiority acquired on either side; at least as regards the number of ships employed, and the power of riding paramount on the high seas. This was partly owing to the smallness of the vessels of war, as compared with such as are now admitted into the line of battle.[*] Ships could then be prepared and manned with very great celerity, and consequently when exertion became necessary, a strong numerical force was quickly collected. The defeat of De Witt and De Ruyter stimulated the United Provinces to strain every nerve to regain the advantages which they had lost; and Van Tromp again appeared in the Downs in the command of a fleet of fourscore men-of-war. His purpose was to seek Blake, of whose deficiency of force he was probably well informed: the English Admiral had not only been ordered to weaken his fleet by despatching large detachments on different services, but it has been asserted that the Parliamentary Committee, having by this time become jealous of all their great commanders, were careless of repairing the damaged ships, or of expediting the necessary supplies. From some, or all of these causes, it happened that Blake had only forty ships under him, when Van Tromp appeared at the back of the Goodwin Sands, where these two valiant chiefs had fought before; a choice of position which, it is supposed, he meant to be understood as a sort of national challenge.

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[*] Whitelocke's Memorials, p. 5-6. Ludlow's Memoirs, vol. i. p. 428. Heath's Chron., p. 596.

[*] The comparative ease with which this could be effected, will be apparent when it is understood that at this time any merchantman, capable of carrying guns, could with a few alterations be converted into a man of war. It appears on the authority of the Parliamentary Journals of 1651, containing a list of merchantmen thus altered for the navy, that a vessel of 900 tons burthen could be made a man of war of 60 guns; and those of 700, 400, 200, 100, and 60 tons, rendered ships of war respectively, of 46, 34, 20, 10, and 8 guns; five or six men being allowed for each gun. It is further to be observed, that naval battles were not then fought in line, the first engagement of that description being the celebrated sea fight of the third of June, 1665, in which the Duke of York, afterwards James II., gained a victory over the Dutch Admiral Opdam, whose ship was blown up in the conflict. James, in

Blake placed, by orders from home, in this mortifying state of inferiority, immediately called a council of war, when it was decided that a battle should be hazarded, under all disadvantages. Dr. Johnson, in his life of Blake, blames this resolution as exhibiting more of the rashness of a private soldier, than the wisdom of a commander. Something, however, must be allowed for the reluctance of a man of invincible spirit, to endure a second insult from the same adversary; and probably still more to the state of party at home, where a faction was anxious to lower his popularity. Nor is it quite clear that in a national point of view, more might not have been lost by declining an engagement than by risking a defeat without dishonour. Van Tromp might undertake with a strong and uncrippled fleet, what he would have been unable to effect after a dear-bought victory. At all events, it is to this daring spirit that the English navy owes its high character; and it is scarcely correct to judge of master minds by maxims applicable only to the mediocrity of talent possessed by the great mass of mankind.

After the determination to fight had been taken, the engagement would have commenced immediately, but for a change of wind, which postponed it until the next day. Early in the morning both fleets plyed a little to the westward, the English having the weathergage; and about noon the action began. It appears, that beside the great disparity in numerical strength, the English fleet was so poorly manned, that a great part of it could not engage at all, so that a few ships bore the brunt of the action. Of these the principal were the Victory, the Vanguard, the Garland, and the Triumph, the admiral's own ship. The action lasted until night, a short time previously to which the adventurous captain of the Garland, of forty guns, made a bold attempt to board the ship of Van Tromp, but fell in the attempt, which led to the capture of his own vessel. The Bonaventure, endeavouring to relieve the Garland, was also captured, after the fall of its commander. Blake himself was boarded,

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his "Life," attributes the introduction of the naval line of battle to himself; and if so, it does considerable honour to his professional skill, having been practised without variation by all our great admirals, until Lord Rodney was induced by Clark's "Essay on Naval Tactics," to adopt the manœuvre of breaking the line in his celebrated engagement with Count de Grasse. The following abstract is condensed from an elaborate list of the British navy, as it existed in 1675, about twenty years after the death of Blake. It is made up from a document in the handwriting of the eccentric sea-chaplain Henry Teonge; and from a similar statement, supplied to the House of Commons in the same year, both appended to Teonge's published diary. According to these authorities, the navy then consisted of—

8 First-rates, of from 100 to 90 guns, varying in tonnage from 1556 to 1102 tons, in length from 137 to 122 feet, and carrying from 550 to 850 men;
9 Second-rates, of from 84 to 64 guns, varying in tonnage from 1032 to 663 tons, in length from 120 to 110 feet, and carrying from 530 to 410 men;
22 Third rates, of from 74 to 56 guns, varying in tonnage from 978 to 417 tons, in length from 127 to 107 feet, and carrying from 500 to 340 men;
37 Fourth-rates, of from 60 to 40 guns, varying in tonnage from 657 to 354 tons, in length from 110 to 88 feet, and carrying from 300 to 170 men;
15 Fifth-rates, of from 40 to 28 guns, varying in tonnage from 366 to 180 tons, and carrying from 150 to 100 men;
8 Sixth-rates, of from 20 to 4 guns, varying in
— tonnage from 194 to 35 tons, and carrying
99 from 80 to 45 men;
With 49 sloops, doggers, smacks, yachts, fireships, &c. &c., carrying from 12 to 2 guns, and collectively manned by 1401 seamen.

It will be perceived that there is much discrepancy between the rates of tonnage of many of the vessels, and the number of guns which they carried—a fact to be accounted for on the presumption that adapted merchantmen could not always be made to carry guns in proportion to their tonnage; or that very different weights of metal are referred to. Of the foregoing ships, which are rated as in the original documents, one first-rate, six second-rates, eleven third-rates, twenty-six fourth-rates, one sixth-rate, and four smaller vessels—in all forty-nine, alone existed before the Restoration; which shows the rapid increase of the navy in the brief interval of fifteen years.

twice, and but for the brave manner in which he was supported by the Vanguard and the Sapphire, he would have fallen into the hands of the enemy. Beside the two ships taken, another was run ashore, and the entire fleet was so shattered, that had not night favoured their retreat, the consequences might have been still more disastrous. As it was, they were enabled to reach the Thames, and thereby defeated the intention of Van Tromp to assail them the next day with fire-ships, and complete their destruction. One of the Dutch flag-ships was blown up; and those both of Van Tromp and his vice-admiral, De Ruyter, were so damaged, as to require immediate laying up. This unequal contest lasted from eight in the morning of the 29th November, 1652, to six o'clock in the evening*.

The Dutch admiral, puffed up with this momentary advantage, was so vainglorious as to sail through the channel with a broom at his mast-head, to signify that he had swept away the English from that sea; and the populace of the United Provinces equally elated, with the usual presumption of success, talked of capturing the whole of the English West India islands†.

The emptiness of the bravado of Van Tromp, and the futility of the expectations of his countrymen, were soon made apparent; for in about two months Blake, with whom, at his own request, Monk and Deane had been joined in commission, was enabled to repair and fit out a fleet of eighty sail of ships of war. With these they quickly sought and again encountered Van Tromp, who, with a fleet of seventy sail of vessels of war, and no less than three hundred merchant ships under his convoy, was returning up the Channel from the Isle of Rhé. Blake commenced the action off Portland with twelve ships, led by himself in the Triumph; and so warm was the conflict, that his own ship received no fewer than seven hundred shots in her hull, and might have been sunk but for the timely relief afforded by Captain Lawson in the Fairfax. In this action, which took place on the 18th February, 1653, Blake lost his own captain, a distinguished veteran named Ball, his secretary Mr. Sparrow, and received himself a grievous wound in the thigh. As usual, the fight lasted until night, when the Dutch, who had six men-of-war sunk and taken, retired. Blake, after sending ashore his sick and wounded men, pursued the enemy; and for the two following days occasional encounters took place, in which both sides fought with extraordinary fury. At length the Dutch fleet reached the sands of Calais, where they anchored, and, favoured by the light draft of water of their shipping, they were enabled safely to tide it home. In these engagements the Dutch lost eleven ships and thirty merchantmen; and, according to their own accounts, full 1,500 seamen. The English lost only one ship; but the number of seamen killed and wounded was equal to that of the enemy. It is recorded, that being short of hands, Blake had embarked some regiments of soldiers on this occasion, who contributed greatly to the victory, and most probably their evident utility led to the establishment of regular corps of marines.

Towards the end of the following April, Blake and his former colleagues, with a fleet amounting to a hundred ships of war, attacked a Dutch fleet of seventy sail on their own coast; and, after capturing fifty doggers, drove them into the Texel. They then sailed northwards in search of Van Tromp, who with a rich fleet of merchantmen under convoy, having deemed it hazardous to enter the Channel, had steered round the north of Scotland. With great dexterity that able seaman contrived to escape the three English admirals, and to lead his merchantmen safely into port; a very beneficial service, but almost ludicrously contrasted with his former "top gallant humour," as one of the writers of the period has called it, of sweeping the British shipping from its own seas.

At length, convinced of the absolute necessity of again bestirring themselves with energy, the States enabled Van Tromp to put to sea, with a fleet of one hundred and twenty ships; and on the third of June he came into contact, off the North Foreland, with the English squadrons under Monk and Deane. Almost in the beginning of this engagement, Deane, a commander of distinguished reputation, was carried off by a cannon ball; and although, after a conflict of six hours, the Dutch retired, the success was but equivocal. The arrival of Blake on the fourth, with eighteen fresh ships, turned a partial advantage into a complete victory. Of the Dutch fleet six were sunk and eleven captured, and the number of prisoners amounted to 1350, of whom six were captains. The English, on the contrary, lost not a single ship, while the number of killed and wounded fell short of 260. In this battle Van Tromp boarded the English vice-admiral Penn, but was not only beaten off, but himself boarded in return, and he would have been taken but for the timely assistance of his colleagues, De Witt and De Ruyter. It was, in fact, only by retiring once more among the flats and shallows of the Dutch coast, that Van Tromp was enabled to save the greater part of his fleet.[*]

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* Lives English and Foreign, vol. ii. p. 104.

† Heath's Chronicle, p. 381.

The discontent of the people of the United Provinces during these successive defeats and mortifications was extreme; and the alternate despondency and presumption which they displayed, afford a very instructive lesson to those politicians who work on the popular feeling, and lightly employ the ignorance, the prejudices, and the inconstant passions of the multitude. What beyond a candid and patriotic appeal to the actual interests of the people can the honest statesman require? Upon any real emergency would such appeal be less forcible or the motives to exertion less earnest? Who in the long and vague annals of history, abounding as they do with the crimes and errors of the human race, but must perceive the readiness with which men usually answer the calls for sacrifices, when absolutely and evidently necessary? Where is the country whose records do not contain many more examples of brave and patriotic devotion in cases of urgent need, than of shameless and pusillanimous self-abandonment? It is however fair to remark, that rulers often participate in the errors which they propagate; and many a ruinous course of policy has been pursued with a firm conviction that it was just and necessary. Knowledge, then, on both sides is the only corrective: on that of the ruler, that it may not err with good intentions; and on that of the people, that they may discountenance every injurious appeal, whether the motives in which it originate be insidious or sincere.

While these contests were taking place at sea, an important change was effecting in the government at home. In the month of April, 1653, Cromwell turned out the remnant, or, as it has been usually termed, the Rump of the Long Parliament, and took measures for the assumption of supreme power. The States and the Royalists looked forward with great anxiety to the manner in which the fleet and its commanders would receive this bold act of usurpation. Whatever hopes they might have formed were quickly terminated by the publication of a formal declaration from Blake, Deane, Monk, and the rest of the sea officers, that notwithstanding the recent changes, they felt that their duty, and the national trust reposed in them, required a continuance of their exertions against the foreign foes of the Commonwealth. Blake, on this occasion, emphatically expressed his often quoted opinion, that it was not *their* business to mind state affairs, but to prevent the enemy from taking advantage of our domestic disputes. "Remember," said he, "that we are Englishmen, and that our foes are foreigners."[*] The unsophisticated good sense of Blake perceived that a maintenance of the British ascendancy at sea, was equally necessary under every sort of sway; and that it was not for foreigners to profit by our dissensions, however they might originate, or to whatever they might conduce. At the same time, he had the less temptation to act otherwise, as the Parliament had, by this time, become exceedingly unpopular with the nation, in consequence of a design to perpetuate themselves being strongly suspected by all parties. The same jealousy, whether well founded or not, had been manifested by the Parliament towards the officers of the navy as to those of the army, which rendered them indifferent to a change, whatever they might think of the character of that which took place. As to Blake himself, he was probably too sincere a Republican to approve cordially of the approaching exaltation of Cromwell; for although on his return home in ill health, immediately after his last victory, he was appointed a commissioner for Somersetshire, in the Mock or *Little Parliament*, and was otherwise much consulted, it was so exclusively in relation to naval affairs, or foreign warfare, that his name stands perfectly clear of every shadow of imputation of cabal, or intrigue. On this account, as already intimated, he was regarded with respect by the most opposite parties; all of whom beheld in him a spirited and disinterested defender of his country, and an honour to the English name.

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[*] Blake and Monk's Despatch.

[*] Fasti. Oxon. vol. i. Coll. 204. Lives English and Foreign, vol. ii. p. 109.

Before the health of the admiral was sufficiently recovered to go to sea again, the fleet commanded by Monk fought the famous battle with that of the United Provinces, which terminated in the death of Admiral Van Tromp, and in a bloody and dear bought victory by the English. Although not present at this engagement, which took place on the 29th, 30th, and 31st of July, 1653, Blake had assisted so much in getting the force equipped, and by his counsel generally, that parliament decreed him a gold chain in common with the other admirals; and in the following October, when he came to London and took his seat in the House of Commons, he was solemnly thanked for his many and important services.*

The formal assumption of the Protectorate by Oliver Cromwell distinguished the close of the year 1653, in which arrangement Admiral Blake appears rather to have acquiesced than assisted. This event was followed by a peace with the United Provinces, with whom negociations had commenced soon after the battle in which Van Tromp lost his life. The terms of this treaty, which was signed in April, 1654, were highly honourable to England: the Dutch gave up every thing they had professed to fight for, although, in the exaction of some of our claims, there is reason to believe that, satisfied with the honour of maintaining them, Cromwell was not very rigid in their precise fulfilment.

Such was the result of the first of those struggles with the Dutch for naval dominion, which were so uselessly renewed after the Restoration, and which, as far as that direct species of rivalry was concerned, terminated at the Revolution of 1688. To the naval superiority obtained by the English, since that remarkable period in the annals of both, it is scarcely necessary to allude, except, perhaps, for the sake of remarking that while struggles for mere glory are unprofitable at best, they are still more unadvisable, where fluctuating sources of prosperity are called into a contest with great physical superiority, and higher natural advantages. Such was the case with the United Provinces, as compared with Great Britain; to say nothing of the strong motives to a friendly union between them, as regarded the more formidable foes of both. The two powers have since been frequently at war; but on which ever side the provocation has originated, the result has always been most injurious to the States. It must not be presumed, for a moment, that the foregoing argument is advanced with a view of deprecating those glorious contests with powerful tyranny and oppression, like that which released the United Provinces from the yoke of Spain, or in objection to such exhibitions of national spirit and just jealousy for the honour of the country, which are essential to its independence. Here danger may be nobly incurred, and sacrifices justly as well as wisely called for; but how few are the wars of this description, compared with the number of unnecessary conflicts produced by illiberal jealousy, venal intrigue, and personal ambition! However visionary those ideas of perpetual peace may be, which ardent and benevolent minds persuade themselves may be realized, we surely may cherish the hope that the unholy and indefensible warfare, to which we are alluding, will necessarily decrease, in proportion to the diffusion of information among the great mass of mankind.

CHAPTER IV.

Expedition to the Mediterranean—Respect paid to Blake by the Officers of France, Spain, and Holland—Negotiation with the Dey of Algiers—Chastisement of the Bey of Tunis—Redress exacted for injuries and insults to the English in the Mediterranean—Respect paid to the Protector by the Italian States—War with Spain—Expedition to Cadiz—Illness of Blake—Exploit at Santa Cruz—Behaviour of the Admiral in respect to Captain Blake—Sails for England—Death—Funeral Honours—Treatment of his Remains at the Restoration—Character.

IN the first parliament called by Cromwell, in September, 1654, Blake was once more chosen to represent his native town of Bridgewater; but, although by the peace with the United Provinces, the necessity for naval exertions was much abridged, the mistaken policy * of Cromwell having decided on a war with Spain, he was soon called again into active service. The known attachment of the admiral to republicanism has been alleged on this occasion also, as the cause of his appointment to the command of a fleet; but surely, having determined upon hostilities, the selection of the most eminent seaman in the country seems only to have been a matter of course.

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* Lives, English and Foreign, vol. ii. p. 109 Winstanley's English Worthies, p. 555.

* Cromwell had not the merit of perceiving the rising ascendency which the genius of Cardinal Richelieu had been preparing for France; and, consequently, was unconscious how much his decision against Spain, in furtherance of the ambitious views

In the first instance, however, Blake was despatched in November, 1654, with a formidable fleet into the Mediterranean, to support the honour of the English flag, and to procure satisfaction from the Barbary Powers, for their many acts of piracy against British merchantmen. This expedition was sent out before war was declared against Spain; so that in the ensuing December his fleet entered the port of Cadiz, where he was received with all imaginable respect. This, no doubt, was partly owing to the anxiety of the Spaniards to keep well with the Protector; but no small portion of homage was excited by the known talents and high achievements of the gallant commander himself. Aware of former consequences, a Dutch admiral would not hoist his flag while Blake remained at Cadiz; and a French squadron having stopped one of his tenders, which had been separated from him in a storm, the commander, as soon as he knew to whom he belonged, sent for the captain on board the flag-ship and drank Blake's health in his presence, under a discharge of five guns.[*] The Algerines were likewise so daunted by the terror of his name, and so apprehensive of his designs, that, of their own accord, they stopped the Sallee Rovers and made them give up what English prisoners they had on board, which they sent freely to the admiral without ransom. These concessions, however, did not prevent him from sailing to Algiers, where he appeared on the 10th March, 1655, and sent an officer on shore to demand the release of all English captives, and ample satisfaction for the piracies committed on the British trade. The Dey, who seems to have known the best manner of soothing a temper like that of Blake, pleaded his inability to release ships and captives which had become private property, without producing a mutiny; but the latter he agreed to give up on a moderate ransom per head, and offered to make such a peace with England as should prevent all future hostilities. He accompanied this answer with a large supply of provisions, and for the present, Blake appeared satisfied. It is not unworthy of remark in this place, that these maritime plunderers have continued, in a similar manner, the objects of alternate chastisement and negociation to this hour, when a leading European nation has a fleet before Algiers, on an errand precisely of the same nature as that of Blake's, upwards of one hundred and seventy years ago. It is melancholy to reflect, that a fine and extensive coast like that of the north of Africa, once, too, the seat of great comparative civilization, should have been allowed to remain in the possession of successive hordes of incurable pirates, insolent and rapacious by turns to all Christendom. If endured, because dangerous plans of national aggrandisement might follow their destruction—what a satire upon the moderation of the great Christian powers! If acquiesced in by some nations because a greater injury is inflicted upon others—how discreditable such motives to religion and humanity! Under every view of the case, the long toleration of this nuisance is a disgrace to civilized Europe.

From Algiers, the admiral sailed to Tunis, the Bey of which, relying upon the strength of his fortresses, returned an insolent answer to the message of Blake, and even refused to allow him to supply himself with fresh water. "Here," said the barbarian, "are our castles of Goletto and Porto Ferino; do your worst: do you think that we fear your fleet!" On receiving this hasty reply, the Admiral immediately bore away into Porto Ferino, with his first and second rate ships. He reserved his fire until they had approached within a musket shot of the castle and line of fortifications, when he opened his guns so effectually upon both, that in two hours the castle was rendered defenceless, and the guns on the works along the shore were nearly all dismounted, although no less than sixty had played on the English fleet at one time. Nine ships were lying in the harbour, and Blake ordered every captain,

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of that power, would prove nationally injurious. The arrogant spirit of encroachment, displayed by Louis XIV. in the succeeding half century, rendered this impolicy very conspicuous. But a Spanish war was more popular, and, looking to immediate consequences, more profitable than a French one.

[*] Lives, English and Foreign, vol. ii. p. 114.

including even the captain of his own ship, to proceed in their long boats, with chosen crews, and destroy them. This was accordingly executed, with the loss of only twenty-five men killed, and forty-eight wounded, while the Admiral and his fleet covered the assailants from the fire of the castle, by playing continually on it with their cannon. This daring action spread the terror of his name, and produced concessions with very little trouble from the Bey of Tripoli; after which, he again returned to Tunis, where he now met with nothing but submission. As the purpose of this expedition was to procure satisfaction for all the injuries and spoliation suffered by the English in the Mediterranean, during the civil wars, when it was thought they could be inflicted with impunity, several of the minor Christian powers, who had taken similar liberties, were next called to account. Among the rest, the Knights of Malta were obliged to submit to reparation, as also the Duke of Tuscany, who was compelled to pay 60,000*l.* as a compensation for losses sustained from his subjects by the English. It is added, that the Admiral sent home no less than sixteen ships, laden with effects thus exacted, for insults and injuries endured by English subjects in that sea, during the political struggles which had harassed their country at home.*

These exploits were performed in the spring of 1655, and such a formidable opinion did they create of the power, strength, and tenacity of the English government, that most of the states of Italy thought proper to send messages of compliment to the Protector; and the Grand Duke of Tuscany and the states of Venice, in particular, distinguished themselves by splendid embassies. It is, in fact, difficult to select a period in English history, when the country was so feared and courted, as under the Protectorate of Oliver Cromwell. Some of this deference was, no doubt, attributable to the political situation of Europe at the time, but no small part was due to the great abilities of the Protector, and to the vigour and efficiency of his councils. His instruments too, as in the instance of Blake, were well chosen; and as, by the depression of the ancient aristocracy, he was called upon for few or no sacrifices to family support and connexions, so he had no occasion to give employments to persons who were unfit for them. He was indeed one of those master spirits, who can employ ability without fearing it—a faculty exceedingly rare, even among able rulers.

By this time, the secret expedition, under Penn and Venables, sent by Cromwell to surprise and capture St. Domingo, and which terminated in the taking of Jamaica, had become known to the court of Madrid, which immediately confiscated all the English property in Spain; and the war between the two countries was from that time carried on with extreme vigour and animosity. Blake, of course, did his best to ruin the maritime force of Spain in Europe, as Penn was endeavouring to do in the West Indies; and so great and incessant was his activity, that his constitution began to sink under efforts so unremitting. Fearing that some bad consequences might ensue, if he were not joined by a colleague, proper to take charge of the fleet, in the event of his decease, he suggested the expediency of joining some able commander in the commission with himself; in compliance with which suggestion, Admiral Montague was sent out, with a strong squadron to reinforce and assist him. Soon after the arrival of Montague, they repaired, with the joint fleet, to Cadiz in 1656, where they continued to blockade a Spanish squadron for several months. The Admiral then having taken the major part of his fleet to the coast of Portugal, to obtain water and refreshments, Captain Stayner, who had been left cruizing with a small squadron, fell in with the Spanish homeward-bound Plate fleet, and captured the Vice-Admiral, Rear-Admiral, and another galleon, with two millions of dollars on board; all which prizes, together with the prisoners, were sent to England, under Montague; Blake, notwithstanding his illness, remaining in the Mediterranean.

The maladies with which this indefatigable officer was afflicted, were the dropsy and the scurvy, which now began to make dreadful ravages in his constitution; yet his spirit remained unabated; and being informed that another Plate fleet had put into Santa Cruz in the island of Teneriffe, he sailed thither in the month of April, 1657, with a fleet of twenty-five men-of-war. He arrived in the offing of Santa Cruz on the 20th, where he discovered six heavy galleons and ten smaller ships moored close to the shore, with their broadsides towards the sea, the inner vessels secured by a boom, and all disposed in such a manner as to present the appearance of being almost unassailable. Nothing seemed to have been omitted by the Spanish commander, a man of courage and conduct, to render a successful attack impossible. The ships were defended not only by a strong castle in a very commanding situation, and furnished with heavy ordnance, but seven additional forts had been erected, mounting from three to six guns each, and united by lines of communication, manned by musketeers. Yet, notwithstanding these able dispositions of the Spanish General, such an idea was generally entertained of Blake's enterprising character, that the captain of a Dutch merchantman, then in the bay, at once made up his mind, from the manœuvres of the English Admiral, that an attack was intended; and to avoid ill consequences to himself from the approaching conflict, he immediately waited upon the Spanish Commander, and requested leave to quit the harbour, plainly stating as his reason for the request, his conviction that Blake would be soon among them. The resolute Spaniard at once granted him the desired permission, exclaiming with a confident smile—"Get you gone, if you like, and let Blake come if he dare."*

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* Hist. of the Rebellion, vol. iii. p. 590. Heath's Chronicle, p. 366.

The Admiral had by this time settled the question of daring, having made all his dispositions for the attack. A squadron of ships was selected for the first onset, commanded by Captain Stayner, in the Speaker frigate, who proceeding directly into the bay, assailed the Spanish fleet with extreme fury, perfectly regardless of the guns of the forts which played on his ships in every direction. Another division of the fleet was judiciously sent to occupy the attention of the castle and the forts, while Blake himself joined Stayner, and attacked the Spanish ships, which were not much fewer in number than the English, while the crews greatly exceeded them. Notwithstanding this advantage, in a few hours the Spaniards were driven entirely from their shipping, and Blake, who perceived the impossibility of carrying the vessels out, ordered his men to set fire to their prizes. This was done so effectually, that all the Spanish ships were reduced to ashes, except two, which sank during the engagement, and exhibited only a small portion of their masts above the water.*

It is necessary to mention a circumstance which has exposed this celebrated affair to much professional remark, both at the time it occurred, and even since. It is stated that the direction of the wind which prevented Blake from bringing his prizes out, would have prevented him from getting out himself, but for its sudden veering to the south-west, a change of very rare occurrence at that time of the year. Should this latter assertion be true, it must be confessed that this daring attack wears the appearance of a trusting to contingency, or bare possibility, which must be deemed rash in the extreme, and so it has been frequently termed by authors of considerable reputation. Unhappily the gallant performer of the exploit died before he reached his native land, which deprived the world of his own explanation of the affair; but as the bay of Santa Cruz is open, without any difficulty in the egress, we cannot help suspecting, that the land breeze, which so timely carried him out, was not so unusual as here represented; and that he rested upon a feasible exertion of skill and seamanship, and not upon an interference in his favour so apparently special, that it might almost be deemed miraculous. The writer of the account whence we gather this narration,† directly attributes this change of wind to Providence, which leaves Blake's professional prudence in great jeopardy, as he could have scarcely looked forward to such an interposition. Is it not more probable, that a man, who united so much coolness and judgment to undaunted resolution, saw many things possible which were invisible to less gifted eyes? Blake never seems to have made any signal mistake in the whole of his naval career, for it has already been shown, that his attack of Van Tromp, with an inferior force, has by no means been proved to be either unnecessary or unadvisable. Other and more general reasons render it probable that the alleged critical change of wind was exaggerated in the narratives of the day People like to seem indebted to the visible favour of Providence, and its special protection was always very unequivocally claimed by that predominant English party to whom Blake's success was peculiarly acceptable. On the other hand, a taste for the marvellous is even still more prevalent; and simply as an extraordinary event, the more surprising the version of the story, the more would it be cherished by the multitude. In a word, it is difficult to believe that an officer of the high character and experience of Blake, would risk his reputation by an act which nothing but a most unusual phenomenon could prevent from being at once fatal to himself and injurious to his country.

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* Heath's Chronicle, p. 391.

* Heath's Chronicle, p. 391.

† Heath.

Rapin, who seems never to have been cordial to the memory of this great seaman, on account of his success against the Dutch, remarks, that however heavy the loss to the Spaniards in ships, money, men, and merchandise, the English gained nothing by this enterprise, but glory.* Dr. Johnson however, tersely and justly observes, that in warfare an increase of military reputation is an increase of power, and that he who weakens his enemy, in effect strengthens himself.† As respects Spain, this was particularly the case, for her South American treasures had become the chief source of her power of annoyance. This is not to defend the vain glory of war, or to vindicate its barbarities: the more clearly indeed it is shown that havoc and destruction are inevitably connected with it, the more plainly is proved the wickedness of that policy which would wantonly inflict its horrors, or create artificial pretexts for the calamities which are its inseparable attendants.

To return to the Admiral: the union of skill and bravery in this transaction is forcibly evinced by the fact that the loss of the English amounted, in killed and wounded, to about 200 men only, without the destruction of a single ship. An affair, which must have been very afflicting to him, occurred in this battle, and the manner in which he acted in respect to it exhibits the clear and patriotic spirit of the man most characteristically. His brother, Captain Humphrey Blake, who commanded a ship for the first time, showed some lack of courage and talent as an officer,‡ which convinced Blake that he was altogether unfit for the profession of arms; and with the inflexible spirit of an ancient Roman, the Admiral immediately cashiered and sent him home. What adds to the fine spirit of this conduct is, that he continued to regard him kindly as a brother notwithstanding, and at his death left him his paternal estate. A stranger to fear himself, he was enough of a philosopher to be satisfied, that a constitutional temperament is not always to be corrected by the will; and that a man may be useful in the peaceable walks of society, whom it is impossible to stimulate into military ardour. His country, its service, and its renown, were preferred to everything else in the mind of Blake: those saved harmless, he was again enabled to indulge his domestic affections; and in all his dealings with vanquished enemies, he was uniformly one of the most humane and placable of men.

As soon as the news of this extraordinary piece of service reached England, the Protector sent his secretary to acquaint the Parliament, who ordered a public thanksgiving, and directed that a diamond ring of the value of 500*l.* should be sent to the Admiral. One hundred pounds were also voted to the Captain who brought home the news; and the thanks of the House were ordered to be conveyed to all the officers and seamen employed, by the mouth of their commander. As the affair of Santa Cruz was the concluding exploit of this valiant seaman, so the honours thus conferred upon him proved the last testimonials of respect that he was destined to receive from his beloved and grateful country. Returning towards the Mediterranean, after cruising some time before Cadiz, he discovered that his end was rapidly approaching, and became anxious to reach England. This, however, he was never again to behold, for he died just as the fleet reached Plymouth Sound. As he approached the Channel, it is said that he frequently inquired if the land was seen; but the exact circumstances attendant on his death are not recorded. He yielded up his gallant spirit on board the St. George, on the 17th day of August, 1657, having just completed his fifty-ninth year.*

The life and death of Blake will remind the reader of two distinguished Admirals of modern times:—the splendour of his career resembling the heroic Nelson's—and its close, that of the indefatigable and devoted Collingwood!

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* Rapin, Hist. of Eng., English 8vo. edition, vol. xi. p. 96.

† Life of Blake in Gent. Mag.

‡ Lives, English and Foreign, vol. ii. p. 121.

* Mercurius Politicus, p. 375.

Nothing was wanting on the part of the Protector, the Parliament, or the people, to evince their high estimation of a man who had so ardently and disinterestedly devoted himself to the service of his country. The day after he died, he was embalmed and wrapped up in lead; his bowels were buried in the Great Church, at Plymouth, and his body sent round with the fleet to the Downs, and thence conveyed by water to Greenwich. There it lay in state, until the 4th of September, when it was borne up the Thames in a barge, covered with black velvet, and adorned with escutcheons and devices, to Westminster. Besides his brother, relations, and domestics, the funeral was attended by Oliver's Privy Council, the Commissioners of the Admiralty and Navy, the Lord Mayor and Aldermen of London, the Field Officers of the Army, and other persons of office or quality, who followed in a great number of barges and boats, covered with black cloth, and marshalled by the Heralds at Arms, who arranged the procession. On landing, they proceeded through a guard of several regiments of foot, drawn up to receive the procession at the Abbey; General Lambert, with whom the deceased had been on terms of great intimacy, being present. The procession having reached the Cathedral, the body was interred in a vault constructed for the purpose in Henry the Seventh's Chapel.[*] It is melancholy to be obliged to add, that at the Restoration the shadowy honour of an interment in the Abbey was no longer to be allowed to this great commander, whose body was dug up with those of Cromwell, Ireton, and many more. Some distinction was however made: the remains of Blake were decently reinterred in St. Margaret's Churchyard, while the bones of the others were treated with the greatest ignominy.[†] The propriety of this transaction as regards Blake was questioned at the time, even among the friends to the restoration; at present it will be regarded with unmixed disgust. The naval services of this valiant man were so truly national; he had done so much to render the power and character of his country respected, and in such strict accordance with the ideas entertained of public duty on all sides, that any manifestation of disrespect to the ashes of so illustrious a patriot, was as revolting to good feeling as to good policy. In every point of view, indeed, posthumous revenge is mean and disgraceful; and those who can derive satisfaction from insulting the remains of men, before whose ascendency they were forced to bend while living, only doubly proclaim their natural inferiority.

To the public and professional character of Blake the testimonies are numerous; and with a little abatement on the score of party feelings, nearly unanimous. It has been already remarked, that, in common with many other distinguished characters of the day, he appears to have formed his notions of patriotism from the republican models of antiquity.[*] Love of country, and devotion to its greatness, freedom, and independence, were, theoretically at least, the primary duty of every wise and virtuous republican of Greece and Rome; and Blake adopted that principle with a stoical firmness of soul, which enabled him to excel nearly the whole of his contemporaries in fulfilling his high notions of the sacrifices due from a patriot to the public good.

From the moment Blake entered public life, he never seems to have indulged in any sort of cabal or intrigue for political influence; the peculiar openness and sincerity of his conduct being vouched for by all who have written about him.[†] His freedom from every thing like a passion for acquisition, was equally conspicuous; for notwithstanding the immense sums which passed through his hands, so upright was his conduct as a public servant, that he scarcely left 500*l.* behind him, in addition to his paternal estate of about 200*l.* per annum. Love of fame may very possibly be thought to have been a considerable incentive: it might be so, but the love of fame is injurious only so far as it conduces to a selfish performance of extraordinary actions, with a view to mere personal notoriety; while, on the contrary, it may be deemed a salutary stimulus to ardent exertions in the fulfilment of duty. It is sufficient to ensure a high estimation of the character of Blake, that with the total absence of all views which, in the general opinion of mankind, are pronounced mean, selfish, or interested, he rendered the greatest services to his country; to advance whose welfare and reputation, formed the constant passion of his life.

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[*] Kennet's Register and Chronicle, p. 586.

[†] Neal's Hist. of the Puritans, vol. iv. p. 174. Grey's Examination of Neal's Hist., vol. iii. p. 318.

[*] The celebrated Hobbes was so impressed with the effect of the Greek and Roman historians and orators on the mind of the youth of the preceding age, that in the spirit of his opinions concerning passive obedience, he goes near to advise their total rejection in the education of Englishmen.

[†] The testimony given of this quality is peculiarly lively and spontaneous. "He (Blake) was," says Whitelock, "a man of as much gallantry and *sincerity* as any of his time, and as successful." Bates, although a very decided royalist, in his Elenchus Mortuum, is equally prompt in the praise of Blake's honour and frankness.

As a warrior, both on sea and land, Blake forms a remarkable instance of the latent aptitude for a peculiar line of exertion, which may exist in men before they have any opportunity of displaying it. He was forty before the civil war broke out, and nearly fifty before he served at sea, and that as a commander at once. The mere fact of fighting ably and bravely at sea, would not distinguish him from many of his colleagues; but he no sooner stepped on ship-board, than he gave a new character to naval warfare, and made the most striking improvement in this important service, by the strength of his own genius, unaided by experience. The testimony of Lord Clarendon is unequivocal on this point, and it cannot be given better than in his own words.

"He (Blake) was the first man who declined the old track, and made it manifest that the science might be attained in less time than was imagined, and despised those rules which had been long in practice, to keep his ship and men out of danger, which had been held, in former times, a point of great ability and circumspection; as if the principal art requisite in the captain of a ship, had been, to be sure to come home safe again. He was the first man who brought the ships to contemn castles on shore, which had been thought ever very formidable, and were discovered by him to make a noise only, and to fright those who could rarely be hurt by them. He was the first that infused that proportion of courage into the seamen, by making them see, by experience, what mighty things they could do if they were resolved, and taught them to fight in fire as well as upon water; and though he hath been very well imitated and followed, he was the first that gave the example of that kind of naval courage and bold and resolute achievements."*

It is scarcely necessary to add, that the foregoing passage from a writer who cannot be suspected of partiality, is conclusive as to the high professional merits of Blake, who seems to possess an indisputable claim to the honour of having infused a great portion of that peculiar energy and spirit into the English navy, by which it has ever since been distinguished. The fact that both in his own days, and subsequently, he has been accused of rashness, will derogate but little from the justness of these pretensions. When a man of invention and enterprise ventures boldly, and is uniformly successful, it is both more generous and more just, to attribute the success to his superior capacity, than to dwell invidiously upon apparent temerity, or surprising good fortune. Every case no doubt is, strictly speaking, individual, and must rest upon its own merits; but the naval annals of Britain would have been very different from what they are, had a too calculating spirit of caution been prevalent in those whose deeds they record.

There is another point of view, in which the character of Blake, as a commander, exacts attention, and that owing to the very peculiar nature of the times, and the consequent object of the expeditions in which he was engaged. A general disposition prevailed, particularly on the part of maritime and commercial powers, to take advantage of the disorders in England; and in consequence, much spoliation and insult had been endured by English merchantmen. To this cause of irritation was subsequently added a manifest reluctance to act fairly towards the Commonwealth, unless when prompted by fear. On this account, Blake, especially in his later services, was frequently called upon to exercise a discretion in his negociations, which peculiarly evinced the spirit and character of the man. It is not to be denied that, in some instances, he displayed the overbearing features of the republicanism of antiquity, and, alive only to the honour of his own country, neglected the consideration which is due to the feelings and rights of others; but this was the prevailing spirit of all the leaders of the Commonwealth, and all men must be judged with an allowance for the predominant sentiment of the times. The sword-in-hand intercourse of the Admiral with the Courts of Spain and Portugal, the Duke of Tuscany, and others in the Mediterranean, more particularly illustrate the existence of the disposition here alluded to, as relates to specific national objects. The following characteristic anecdote, related by Bishop Burnet, exhibits a like spirit in reference to a minor point. Although a similar piece of conduct at present, would scarcely be deemed justifiable, it requires a strong exertion of reason to be altogether out of humour with it.

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* Hist. of the Rebellion, vol. iii. p. 602.

"While Blake lay in the road of Malaga, before the war broke out with Spain, some of his seamen, going ashore, met the Host carrying about, and not only paid no respect to it, but laughed at those who did. One of the Spanish priests put the people upon resenting this indignity, and they fell upon them and beat them severely. When they returned to their ships, they complained of this usage; upon which Blake sent a trumpet to the Viceroy to demand the priest, who was the chief instrument in that ill usage. The Viceroy answered, that he had no authority over the priests, and so could not dispose of them. General Blake, upon that, sent him word that he would not inquire who had the power to send the priest to him, but if he were not sent within three hours, he would burn their town. The Spaniards, hearing this, obliged the Viceroy to send the priest to Blake, and he justified himself upon the petulant behaviour of the seamen. Blake answered, that if he had sent a complaint to him of it, he would have punished them severely, since he would not suffer his men to affront the established religion of any place at which he touched; but he took it ill that he had set on the Spaniards to do it, 'for he would have him and the whole world to know, that none but an Englishman should chastise an Englishman. He then treated the priest civilly and sent him back, being satisfied that he had him in his power. Cromwell was much delighted with this, and read the letter in council with great satisfaction, saying that he hoped he should make the name of an Englishman as great as ever that of a Roman[*] had been."[†]

Had a commander so distinguished as Blake, died within a century of the present time, materials would, most likely, have abounded for a very particular account of his deportment, manners, and conduct in private life; with all those various minor points of character which are so necessary to individualize a portrait, and render it exclusively that of the person whom it is intended to represent. In the time of Blake, there was no periodical press on the alert to diffuse all sorts of information respecting celebrated men; even to a fatiguing extreme. Quartos and octavos did not then appear within three months of the decease of any person of the least notoriety; which if crude and ill-digested as formal biography, at least form a collection of all the matter of fact and hearsay, known or in circulation, for the exercise of sounder judgment and more prudent consideration in after time. We however learn, that in person Admiral Blake was under the middle size; but that his features were prepossessing and manly, with a quick, lively, and intelligent eye. It has already been observed, that from his youth, he was distinguished by gravity, and simplicity of manners, occasionally enlivened by a humorous bluntness of speech. Some homely lines of Winstanley, in his 'English Worthies,' intimate, that he, who made so many men tremble, was himself peculiarly embarrassed and confused in the company of women; a fact which may account for his always remaining a bachelor. He was pious, without displaying any of the affectation and hypocrisy which mingled so much with the religious pretensions of the age, and which prevailed to an almost ludicrous excess among the party to which he was attached. Sincerity and the absence of everything bordering on intrigue, or dissimulation, were indeed the characteristics of Blake. He was liberal to the very extent of his fortune, and his purse was always open to his officers; he was strictly just and humane to every body; and to his sailors he proved himself a parent. This mixture of the amiable and softer qualities with the most fervent courage, invincible fortitude, and eminent talents, is not unprecedented, although rare. It is well for human nature that the union may exist; and to the honour at once of the individual, his profession, and the country which gave him birth, it has seldom been exhibited more conspicuously and more uniformly than in Admiral Robert Blake.[*]

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[*] Another proof of the classical tendency of the Republican spirit of that age.

[†] Burnet's Hist. of His Own Times, fol. edit. vol. i. p. 80, 81.

[*] The fortunes of the brothers of the Admiral are involved in some obscurity; but it Is asserted by the author of 'Lives, English and Foreign,' that his brother Humphrey was so much harassed for his nonconformity, after the restoration, as to be induced to sell his estate and repair with his family to Carolina. A considerable family of the name certainly lived in that state; the head of which was one of the Lord Proprietors. Several descendants of the family are also to be found in the West of England.

LIFE OF DR. ADAM SMITH.

Introduction.

It is well known that the late lamented Dugald Stewart, amidst the profound and comprehensive studies to which his life was dedicated, became the biographer of three of his countrymen—two of them being amongst the most distinguished of whom Scotland has to boast: these were, Dr. Robertson the historian, and Adam Smith. His friend and tutor, Dr. Reid, we place, where we conceive the world has placed him, in a rank far below these, and where we cannot but think Mr. Stewart would himself have placed him, if his affectionate remembrance of his early instructor had left his judgment perfectly impartial with respect to Dr. Reid's merits as a philosopher.

Since the days of the Memorabilia, when Xenophon became the biographer of Socrates, there has been seen perhaps no proportion so equal betwixt the writer and his subject, as when Dugald Stewart wrote the "Memoirs of the Life and Writings of Adam Smith." Yet, congenial as was the theme, and beautifully as he has illustrated the *writings*, there is a deficiency in the *life*. It was observed of Mallet, that he wrote the life of Lord Bacon, and forgot that he was a philosopher. This, at least, cannot be said of Mr. Stewart. He has kept the philosopher so much in mind, that he has almost forgotten the man. In his review of the works of the distinguished person, in his criticism and his comments, we find everything that we can desire and might expect, even from the pen of Mr. Stewart; but we look in vain for those traits of personal character, those slight yet important incidents and anecdotes which marked the individual, which, when preserved and depicted, form the great charm of biography, and which serve, far more than the most laboured disquisition or panegyric, to recommend to us, and quicken our interest in, the circumstances by which the subject of the memorial acquired his celebrity. Mr. Stewart seems to have entertained a difference of opinion upon this point; possibly he deemed it beneath the dignity of the life of a philosopher. Yet the earliest and most amusing, if not most accurate of biographers thought otherwise. "It is not always," says Plutarch, "in the most distinguished exploits that men's virtues or vices may be best discerned; but frequently an action of small note, a short saying or a jest distinguishes a person's real character more than the greatest battles or the most important actions. As painters labour the likeness in the face, so must we be permitted to strike off the features of the soul, in order to give a real likeness to these great men*." Upon this principle has this inimitable writer left us a record of the lives of upwards of fifty warriors, legislators, and statesmen, investing them with an interest and a wisdom which will delight and instruct the last generations of mankind.

There may have been biographers who have carried their passion for detail and minute anecdote somewhat too far, but even in such cases we feel it is rather ungrateful to condemn them; and we might take the very extreme of this class, even Boswell himself, with all his faults, and almost challenge the world to produce another book of biography of equal interest with the Life of Johnson.

But betwixt Plutarch and Boswell there is an interval, almost as wide as between Auchinleck and Chæronea; and Mr. Stewart ought not, perhaps, strictly to have conformed himself to the example of either. Yet we cannot but regret that much that would interest us has been lost for ever; those many peculiarities, those lights and shadows which would have made us familiar with the man, and given a graphic reality to the portrait. Mr. Stewart was the personal friend of Adam Smith during many of his latter years; and for all that related to him previously, it would have been the easiest thing in the world to have collected information and anecdote in the society of Edinburgh. If it be one object, as it must be presumed of the biographer, to extend the fame of the person whose life he undertakes to record, surely it must be obvious how much is lost in this respect by this partial mode of exhibiting him.

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* Plutarch—Life of Alexander.

"The else unvalued circumstances in the lives of literary men" (says Mr. Mackenzie in his "Memoir of the Life of John Home") "acquire an interest with the reader, proportionate to that which the writings of the author have excited; and we are anxious to know every little occurrence which befel him, who was giving, at the period when these occurrences took place, the product of his mind to the public. We are anxious to know how the world treated a man who was labouring for its instruction or amusement, as well as the effect which his private circumstances had on his literary productions, or the complexion, as one may term it, which those productions borrowed from the incidents of his life. These considerations afford an apology for the narratives of the comparatively unimportant occupations which the world peruses with so much interest —they help that personification of an author which the reader of his work so naturally indulges; and if they sometimes put him right in his estimate of the influence of genius or feeling upon conduct, they serve at the same time as a moral lesson on the subject, and a mark as it were of the unexpected shores or islands, sometimes it may be rocks or quicksands, on the chart of life."

SECTION 2.—*From the birth of Dr. Smith till the publication of the "Theory of Moral Sentiments."*

ADAM SMITH was born at Kirkaldy, in Fifeshire, on the 5th of June, 1723. His father was comptroller of the customs at that place, and had in early life practised as a writer to the signet in Edinburgh. He had been for some years private secretary to the Earl of Loudon, when he received his appointment to the customs at Kirkaldy. His wife was the daughter of Mr. Douglas, of Strathenry; and Adam was the only issue of their marriage. His mother lived long enough to enjoy the celebrity of her son; but he had the misfortune never to have known the care and affection of his father, whose death took place a few months previous to the birth of his distinguished offspring. His constitution during infancy, we are informed, was weak and sickly, and required the tenderest solicitude of his surviving parent for the preservation of his life. It is remarkable that in this respect a nearly similar fortune should have attended two of the most remarkable men whom Scotland has produced. It was the fate of Hume to lose his father in his infancy, and to owe, like Smith, to a widowed mother, all the protection and care so requisite at that early period. The mother of our young philosopher was, by some persons, accused of over-indulging her son, but the indulgence of the parent was best vindicated by the growing temper and disposition of the child; and Mrs. Smith during her long life (which extended till within twelve years of the death of her son) had never occasion to reproach herself for any indiscreet kindness, but had the happiness to see her parental care acknowledged to the hour of her death, by every attention which filial affection could prompt.

An accident befel him when he was about three years of age, which, if it had not proved fatal to his life, might have strangely altered his future destiny, and might thus, perhaps, have influenced, in no small degree, the progress of political science in Europe. He had been on a visit to his uncle, Mr. Douglas of Strathenry; and as he was one day amusing himself at the door of the house, he was carried off by a party of gipsies. Happily he was very soon missed by his uncle, who having learned that a set of vagrants had recently passed that way, pursued and overtook them in Leslie Wood—with feelings with which it is easy to sympathize, even without reference to the importance of the life he had preserved.

When the period arrived at which it was deemed proper that he should be sent to school, he was placed under the care of Mr. David Miller, who then taught the school at Kirkaldy,—a person who enjoyed no inconsiderable reputation as a teacher in his day, and who had the fortune to educate, about the same period, a few men of greater eminence in after life than are frequently to be found registered in so obscure a seminary. With some of these Smith contracted an intimacy which lasted during their lives. We are not exactly informed of the time when he was placed under Mr. Miller's care, but we know that he remained with him till he attained his fourteenth year. His great love of books, even in those early years, attracted the notice of his schoolfellows, as did the extraordinary powers of his memory, and those habits of mental abstraction for which he was remarkable throughout life. His love of reading was indulged and strengthened the more, owing to the weakness of his constitution, which prevented his joining in the more active pastimes of his companions. Their fondness for him was not lessened by habits which schoolboys in general might be apt to regard as unsocial, but it arose from the excellence of his temper, and the warm and generous feelings which distinguished him.

It is to be regretted that we know so little of the nature of his reading at this period of his life. That he was well grounded in the dead languages, and that the classic writers of Greece and Rome were favourite objects of his study whilst he was under the care of Mr. Miller, may safely be presumed. His works afford abundant evidence of the extent of his acquirements in this department of literature, a relish for which never deserted him in after life, even amidst the profound inquiries which occupied his attention while engaged in the composition of his greatest work. Had Dr. Smith, however, like Gibbon, become his own biographer, or like Johnson, had he had the fortune to leave behind him such a chronicler as Boswell, we might then have seen, perhaps in the earliest unprescribed studies of the recluse student at Kirkaldy, the first indications of that tendency of mind and mode of thinking which gave promise of the future author of the "Wealth of Nations."

In 1737, at the age of fourteen, he left Kirkaldy, and was removed to the University of Glasgow, where he had the happiness of studying under Dr. Francis Hutcheson, of whom he always spoke, as he has written, in terms of the highest admiration. The lectures of that distinguished professor may be fairly considered as having first directed his views to that branch of ethical philosophy so beautifully illustrated in the "Theory of Moral Sentiments," which he afterwards gave to the world, and in which he has equal merit in having confirmed what was right, and corrected what was wrong in the speculations of his eloquent tutor. It is said, however, that Mathematics and Natural Philosophy engaged the greater portion of his attention during his residence at Glasgow; but his "History of Astronomy" in the Posthumous Essays is the only one of his writings in which we discover much of the fruits of his acquaintance with those sciences. His illustrations are almost always drawn from history, poetry, and polite literature; and, though he prized the persons and the characters of mathematicians and natural philosophers, and has judged highly (perhaps partially) of the tendency of such studies upon the temper and morals of the individual*, it is quite clear that they were neither so congenial to his taste, nor did he estimate their importance to the interests of mankind as being in any respect equal to that of other branches of philosophy, and those more especially which he afterwards himself so largely illustrated and advanced. To these latter, therefore, to the history of mankind, to the moral, economical, and political phases which are presented in its progress, we may be assured, without any particular testimony, that his attention was very early directed, and for a long period of years in a great measure confined. But we have one fact that goes strikingly in proof of this, which is interesting on many accounts, and not the least so as pointing out the first and only book which we know to have been read by him about this period, and which must have been read from love alone, since it was read by stealth.

In 1740, after three years spent at Glasgow, he was removed to the university of Oxford, and entered at Baliol College as an exhibitioner on Snell's foundation. It would appear that shortly after his arrival there, from some cause or other he had given occasion to suspect that his private hours were not always devoted to such books as the discipline of Oxford prescribes to its students; and it was determined therefore by the heads of the college, with more of zeal than honour, that the young philosopher from the north should be taken by surprise in his chamber, in order to ascertain whether the nature of his studies was really orthodox or not. Unluckily, he was found reading the "Treatise of Human Nature," then recently published, and the discovery was of course followed by a severe reprimand and the forfeiture of the forbidden volume. Smith, at that time, knew perhaps nothing more of the book he was perusing than that it was the production of a young Scotchman—a work, which as the author of it said himself, "fell dead-born from the press," little known and a good deal decried, but recommended to Smith by the subject of which it treats, by his love of metaphysics, and the profound and original speculations which it contained; as inviting to the young and free inquirer as they were alarming to the heads of the university. It was not till some years after this that the immortal author of the work in question became known to his young disciple, and that that enduring friendship was cemented betwixt them, which both of them have taken pains to record—"a friendship on both sides founded on the admiration of genius and the love of simplicity," as Mr. Stewart has beautifully expressed it, and which, without biassing the judgment of Smith, must have exalted the pride and the pleasure which he felt, when years after this, he cited him in the "Wealth of Nations" in language which many have thought savoured rather of the warmth of friendship than the calmness of sober judgment, as *by far the most illustrious philosopher and historian of the present age**.

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* Vide Theory of Moral Sent., Part III., Ch. 2.

When Smith was sent to Oxford, it had been the intention of his family that he should study for the Church of England. He remained seven years at that renowned seat of learning; but long before he left it, not finding the ecclesiastical profession suited to his taste, he had abandoned all such intention, and preferred the hopes of such small emolument as his literary attainments might procure for him in his own country, to the higher prospects which the prudence of his friends had pointed out. As there is every reason to admire the independence of mind which induced him to abandon those prospects, we can have none to regret it on any other ground, from the direction which was thus given to the studies and the labours of his future life. There is no doubt that had Dr. Smith voluntarily made the Church his profession, he would have adorned it by genius and learning, that the purity of his life would have added force to the precepts which it would have been his duty to inculcate as a Christian teacher. But this advantage would have been too dearly purchased. The Church would more easily find a substitute for Smith as one of its ministers, than the world might have found one like him, capable of unfolding for its instruction those laws equally divine in their origin and beneficent in their results when rightly apprehended, which regulate the order and advance the moral and political condition of society. The mind of Smith, which found in such subjects a boundless field for his contemplations, might have been confined, and at length contracted, by the professional study of theological learning. The great truths of religion are as simple as they are sublime; and their simplicity renders useless much that human ingenuity can do, while their sublimity defies it. To know God, says Seneca, is to worship him. And much of this knowledge is attained by looking attentively upon the glories of his creation.

It is to be lamented that we know so little of the life of Smith during that part of it which was passed at Oxford. What he thought of that university, of its discipline and its studies, he told the world many years after in a memorable passage of the "Wealth of Nations*," which has never been forgiven by the worshippers of Oxford, and by all those who are prone to consider it a crime to point out the defects of any ancient institution. Strange it may seem that there should always be a number of persons prone to such a course, seeing that the corruptions and abuses which are incident to establishments of this kind, like the diseases in the animal body, have a natural tendency to bring on decay, and that the best friend to such institutions, like the best physician, is he who first discovers the disorder—a discovery necessarily antecedent to the suggestion of the remedy. Yet there are few mistakes so common as this in the world, and few more fatal to its improvement. It is the error of preferring the means to the end, the mere instrument, an instrument often worn out, and sometimes become useless, to the excellent purposes it was designed to work. It may be proper to enlarge a little upon this topic, on account of the unjust prejudice that has been excited against Dr. Smith, in consequence of his animadversions upon Oxford, and is constantly excited for the worst purposes against men like him, whose enlightened and benevolent efforts for the improvement of public institutions, instead of gratitude, have often experienced calumny and opposition. If Smith censured the discipline, or rather the want of discipline, and the abandonment of duty in the tutors and professors of Oxford in his day, what possible motive could he have that is reconcileable with the acknowledged qualities of the man, but a zeal, a warm and indignant zeal, it may be, in behalf of that learning and science which was going to ruin, by the neglect of those who were appointed for their conservation? Of course it is unnecessary to say that we refer not to Oxford as it now is; but if it has been reformed since the days of Smith, it has been reformed only, because some have been found bold and wise enough, like him and after him, to proclaim that it stood in need of such reformation. Far be it from us, and from every friend of learning, to abate that just veneration for the institutions of our country; those especially which have the promotion of science and of virtue for their object, which is really their due—due often to their antiquity — to the excellence of their founders—and to the long catalogue of illustrious men who have been bred under them, and whose wisdom and learning, whose virtue and heroism in after life, seem, by a very natural and pleasing illusion, to become identified with the places in which they were educated.

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* Book v. Ch. 1.

* Book v. Ch. 1. Part 3.

Of the seven years which Smith passed at Oxford little, indeed, has been recorded. We have scarcely an incident relating to his private life, and as little do we know respecting his intellectual habits. Mr. Stewart presumes that he cultivated with particular care, at this time, the study of languages;—a study for which it would seem he had an unusual fondness, and in which, at all events, he is known to have excelled. But Smith studied languages more as a philosopher than a scholar, as they serve to throw light on the manners, the institutions, the modes of thought peculiar to different nations and ages. His knowledge of Greek was profound and accurate; and his taste and high admiration for the drama and literature of the Greeks, preserved to the latest period of his life, may be best traced to the studies and the society in which he mixed whilst at the university. Mr. Dalzell, the distinguished professor of Greek in the University of Edinburgh, has borne testimony to the extent and accuracy of Dr. Smith's acquaintance with that noble language, as often displayed in conversation with him on some of the nicest minutiæ of grammatical criticism. He was accustomed at this time to exercise himself in translation from various languages, chiefly French; and always spoke of it as useful for the acquisition of the art of composition, and for improvement in style. Gibbon has recommended the same practice in his own Memoirs, and a mode of study, we may venture to say, which was pursued and praised by two such distinguished writers, is well worth the attention of all who cultivate literature.

Upon quitting Oxford, Smith returned to Kirkaldy, where he continued to reside with his mother for two years, with the most ardent application to study. In 1748 he removed to Edinburgh, and there commenced his connexion and friendship with many of the distinguished men who then adorned that city; and composed a society which included within its range an extent and variety of accomplishments, and a depth and solidity of philosophy and of learning, not easily equalled in any other, at any period of modern Europe. Among its members we find a vast portion of the names familiar to us, from having enriched the literature of our country in various departments, about the middle of the last century. Those of Hume and Robertson, of Blair, of Ferguson, of Lord Kames and John Home, are known to every reader; but there were others not less accomplished though less known to posterity, whose genius and talents added lustre, even to so brilliant an assemblage of men; Lord Elibank, Sir Gilbert Elliot, Lord Loughborough, Sir William Pulteney, Lord Monboddo, Dr. Logan; these, and many others, we find enumerated in the "Select Society," which was formed in Edinburgh about that period; the list of which Mr. Stewart has preserved*. At this time commenced his memorable friendship with David Hume, the philosopher who had led the way into those very regions of moral and political inquiry, where Smith was destined to follow, guided chiefly, as he always confessed, and as was admitted by his admirers, by that light which had been shed upon them by the most subtle intellect, perhaps, which ancient or modern Europe has produced †.

It was not long after his settlement in Edinburgh, that the friendly patronage of Lord Kames induced Smith to commence a course of Lectures on Rhetoric and Belles Lettres, which he continued for a considerable time; until the high reputation which he had earned, seconded by the zeal of his friends, procured for him, in 1751, the professorship of Logic in the university of Glasgow. In 1752, upon the death of Mr. Thomas Craigie, he was advanced to the chair of Moral Philosophy in the same University; an office which he continued to fill for thirteen years;—a period which he was accustomed to look back upon, as the most useful and happy of his life. "It was indeed a situation," says his biographer, "in which he was eminently fitted to excel, and in which the daily labours of his profession were constantly recalling his attention to his favourite pursuits, and familiarising his mind to those important speculations he was afterwards to communicate to the world."

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* Appendix to the Life of Robertson.

† It is hardly necessary to remind the reader that, in the panegyrics pronounced upon Hume, we refer merely to his celebrated writings upon moral and political science, and not to those upon religion.

It is greatly to be regretted, that no part of his lectures whilst at Glasgow, has been preserved; but the following brief and very interesting account of them was furnished by one of Dr. Smith's pupils, who afterward became one of his warmest and latest friends. There is no necessity to apologise for presenting it to our readers, seeing that we cannot better supply the vacuum that would otherwise be left, owing to the very scanty materials which remain for a life of this distinguished man. "In the professorship of logic," says one of his students, "to which Dr. Smith was appointed on his first introduction to this university, he soon saw the necessity of departing widely from the plan that had been followed by his predecessors; and of directing the attention of his pupils to studies of a more interesting and useful nature than the logic and metaphysics of the schools. Accordingly after exhibiting a general view of the powers of the mind, and explaining so much of the ancient logic as was requisite to gratify curiosity, with respect to an artificial method of reasoning, which had once occupied the universal attention of the learned, he dedicated the rest of his time to the delivery of a system of Rhetoric and Belles Lettres. The best method of explaining and illustrating the various powers of the human mind, the most useful part of metaphysics, arises from an examination of the several ways of communicating our thoughts by speech, and from an attention to the principles of those literary compositions, which contribute to persuasion or entertainment. The first part of these lectures, in point of composition, was highly finished; and the whole discovered strong marks of taste and original genius. His course of lectures on moral philosophy was divided into four parts. The first contained natural theology, in which he considered the proofs of the being and attributes of God, and those principles of the human mind on which religion is founded. The second comprehended ethics strictly so called; in the third part, he treated at more length of that branch of morality which relates to *justice*. Upon this subject he endeavoured to trace the gradual progress of jurisprudence, both public and private, from the rudest to the most refined ages, and to point out the effects of those arts, which contribute to subsistence, and to the accumulation of property, in producing corresponding improvements in law and government. In the last part of his lectures, he examined those political regulations, founded not upon the principle of justice, but of expediency, and which are calculated to increase the riches, the power, and the prosperity of a state: under this view he considered the political institutions relating to commerce, to finances to ecclesiastical and military establishments. In delivering his lectures, he trusted almost entirely to extemporary elocution. His manner was plain and unaffected, and as he seemed to be always interested in his subject, he never failed to interest his hearers. Each discourse consisted of several distinct propositions, which he endeavoured to prove and illustrate. In his attempts to explain them, he often appeared at first not to be sufficiently possessed of the subject, and spoke with some hesitation: as he advanced, the matter seemed to crowd upon him, his manner became warm and animated, and his expression easy and fluent. In points of controversy, it was discernible that he conceived an opposition to be made to his opinions, and that he was led to support them with greater energy and vehemence. By the fulness and variety of his illustrations the subject swelled in his hands, and acquired a dimension, which, without a repetition of the same views, was calculated to seize the attention of his audience, and to afford them pleasure and instruction in following the same object through all the diversity of shades and aspects in which it was presented, and afterwards in tracing it backwards to that original proposition or general truth from which this beautiful train of speculation had proceeded. His reputation as a professor was raised very high; and a multitude of students from a great distance resorted to the University merely upon his account. Those branches of science which he taught became fashionable at this place, and his opinions were the chief topics of discussion in clubs and literary societies. Even the peculiarities in his pronunciation, or manner of speaking, became frequently the objects of imitation."

In the year 1755, a few of the eminent men then at the head of literature in Scotland had established a journal under the title of the "Edinburgh Review;" a title rendered familiar to the readers of the present day by the celebrity of the literary periodical journal under that name, which was established in the same city about half a century later. All that we learn of the plan and object of this design must be gathered from the only two numbers which were published of it. Smith, as is now well known, was a contributor, and, amongst other papers, was the author of the "Review of Dr. Johnson's Dictionary," then recently published, and of a very interesting letter addressed to the Editor, on the state of literature on the Continent, especially that of France. To the curious in literary relics, even these papers will be valuable, as appertaining to so celebrated a man, and the first of the productions of his genius which were committed to the public. In other respects it is perhaps unnecessary to say, that they can add nothing to the fame of the writer. Dr. Robertson was also a contributor; Mr. Hume was not; and we are indebted to Mr. Mackenzie for an amusing anecdote accounting for the omission. Such, we are told, was the extreme artlessness of his character, that his friends feared from it the discovery of their secret;—as they also feared that their criticisms would be disarmed of all their force, from the extreme gentleness of his nature, which could not tolerate even the exercise of literary warfare. The Review immediately on its appearance had attracted, as might have been expected, considerable notice; and Mr. Hume was often expressing his astonishment amongst his friends, that a production of so much talent should be going forward in the city in which he lived, and that he, connected as he was with every literary character of any distinction in it, should know nothing of its authors. It was determined at length that the secret should be communicated to him on a certain day, which was to be agreed upon, provided he would swear to preserve it. The day was fixed,—it was at a dinner where they were all expected to meet; the Review was mentioned;—Hume expressed, as he had done before, his surprise and curiosity on the subject, when he was told by one of the company, that provided he would take his oath not to divulge it, the secret should be communicated to him. "But how is the oath to be administered," said David, with his usual pleasantry, "to a man accused of so much scepticism as I am? you would not take my Bible oath, but I will swear by the το καλον, and the το πρεπον*, never to reveal your secret." Unfortunately, either from want of perseverance in those connected with it, or of encouragement in the public to any undertaking of the kind, the Review was shortly after abandoned, and the distinguished partisan whom they had thus enlisted, had no opportunity of rendering his service in its support.

The Select Society, which we have before mentioned, was another association of which Smith was a member; formed for the purpose of philosophical inquiry, and the cultivation of the art of public speaking. It met for the first time in the Advocates' Library in May 1754, and ever after during the sitting of the Court of Session, every Friday evening. The most distinguished in the Society as speakers were Sir Gilbert Elliot, Lord Elibank, and Dr. Robertson. "David Hume and Adam Smith," says the memorial, "never opened their lips;" an intimation which may occasion some surprise, when it is considered that the two men thus remarked for being mute, were, unquestionably, the most original and profound thinkers in the whole of that gifted assemblage, as well as the most elegant, and (in Mr. Hume's case) the most fluent of writers, and possessing withal ample extent and variety of learning and knowledge. But however able and distinguished in the chair of moral philosophy at Glasgow, and whatever talents he was known to possess in the circle of his friends, it was not until the year 1759 that Dr. Smith gave evidence to the world of those talents, and laid the foundation of his fame, by the publicacation of his first great work, the "Theory of Moral Sentiments," in which he may be supposed to embody the result of a part of his professional labours in the University upon one of the most interesting problems in the whole range of philosophical inquiry.

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* The beautiful and the fitting.

There are few things more pleasing with respect to a character or a composition of established genius, when we contemplate them at a distance, than to ascertain what were the opinions entertained of them by their contemporaries. Fortunately we possess the most satisfactory and delightful of all evidence upon this subject concerning the work before us; but before we enter upon any remarks on this beautiful production, we shall present our readers with a letter from Mr. Hume, addressed to Dr. Smith, immediately after its publication. It would be an injury to withhold this effusion of friendship, which possesses the highest claim upon our attention, from its connexion with one of the most important epochs in the life of the eminent person of whom we are writing. Mr. Hume happened to be in London during the publication of the "Theory of Moral Sentiments," mixing in society most distinguished for rank, taste, and learning, and always anxious, with the generosity and affection which characterized him, to extend the fame and glory of his friend. If the work had been lost to the world, and we had possessed no other evidence of its merits, and of the admiration excited by its appearance, we might form a tolerable estimate of both from the contents of the following letter:—

"*London, April* 12*th*, 1759.

"MY DEAR SMITH,

"I give you thanks for the agreeable present of your 'Theory.' Wedderburn and I made presents of our copies to such of our acquaintances as we thought good judges and proper to spread the reputation of the book. I sent one to the Duke of Argyle, to Lord Lyttleton, Horace Walpole, Soame Jennyns, and Burke, an Irish gentleman who lately wrote a very pretty treatise on the Sublime. Millar desired my permission to send one in your name to Dr. Warburton. I have delayed writing to you, till I could tell you something of the success of the book, and could prognosticate with some probability, whether it should be finally damned to oblivion, or be registered in the temple of immortality. Though it has been published only a few weeks, I think there appear already such strong symptoms that I can almost venture to foretel its fate. In short, it is this —— But I have been interrupted by a foolish impertinent visit of one who has lately come from Scotland. He tells me that the University of Glasgow intend to declare Rouet's office vacant upon his going abroad with Lord Hope. I question not but you will have our friend Ferguson in your eye, in case another project for procuring him a place in the University of Edinburgh should fail. Ferguson has very much polished and improved his treatise on 'Refinement,'* and with some amendments it will make an admirable book, and discovers an elegant and a singular genius. The 'Epigoniad' I hope will do, but it will be somewhat up-hill work. As I doubt not but you consult the reviews sometimes, at present, you will see in the 'Critical Review' a letter upon that poem, and I desire you to employ your conjectures in finding out the author—let me see a sample of your skill in knowing hands by guessing at the person. I am afraid of Lord Kames's 'Law Tracts;' a man might as well think of making a fine sauce by a mixture of wormwood and aloes, as an agreeable composition by joining metaphysics and Scotch law. However, the book I believe has merit, though few people will take the pains of diving into it.—But to return to your book, and its success in this town, I must tell you —— A plague of interruptions! I ordered myself to be denied, and yet here is one that has broken in upon me again. He is a man of letters, and we have had a good deal of literary conversation. You told me that you were curious of literary anecdotes; and therefore I shall inform you of a few that have come to my knowledge. I believe I have mentioned to you already Helvetius's book 'De l'Esprit.' It is worth your reading, not for its philosophy, which I do not highly value, but for its agreeable composition†. I had a letter from him a few days ago, wherein he tells me that my name was much oftener in the manuscript, but that the censor of books at Paris obliged him to strike it out. Voltaire has lately published a small work called 'Candide, ou l'Optimisme.' I shall give you a detail of it. But what is all this to my book? say you. My dear Mr. Smith, have patience; compose yourself to tranquillity: shew yourself a philosopher in practice as well as profession: think on the emptiness and rashness and futility of the common judgments of men; how little they are regulated by reason in any subject, much more in philosophical subjects, which so far exceed the comprehension of the vulgar.

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* The same which he afterwards published under the title of "An Essay on the History of Civil Society."

† This passage is of itself tolerably conclusive as to the vulgar error of confounding Mr. Hume's philosophy with that of the French materialists of the last century and their English disciples in this.—Vide page 10, and note, p. 13.

> —— Non si quid turbida Roma
> Elevet, accedas: examenve improbum in illa
> Castiges trutina: nec te quæsiveris extra.

A wise man's kingdom is his own breast; or if he ever looks farther it will only be to the judgment of a select few who are free from prejudice, and capable of examining his work. Nothing indeed can be a stronger presumption of falsehood than the approbation of the multitude; and Phocion, you know, always suspected himself of some blunder when he was attended with the applauses of the populace. Supposing, therefore, that you have duly prepared yourself for the worst of all these reflections, I proceed to tell you the melancholy news, that your book has been very unfortunate; for the public seem disposed to applaud it extremely. It was looked for by the foolish people with some impatience, and the mob of literati are beginning already to be very loud in its praises. Three bishops called yesterday at Millar's shop, in order to buy copies, and to ask questions about the author. The Bishop of Peterborough said he had passed the evening in a company where he heard it extolled above all books in the world. The Duke of Argyle is more decisive than he uses to be in its favour; I suppose he either considers it as an exotic, or thinks the author will be serviceable to him in the Glasgow elections. Lord Lyttleton says that Robertson, and Smith, and Bower, are the glories of English literature. Oswald protests he does not know whether he has reaped more instruction or entertainment from it. But you may easily judge what reliance can be put on his judgment, who has been engaged all his life in public business, and who never sees any faults in his friends. Millar exults and brags that two-thirds of the edition are already sold, and that he is now sure of success. You see what a son of earth that is, to value books only by the profit they may bring him;—in that view I believe it may prove a very good book.

"Charles Townsend, who passes for the cleverest fellow in England, is so taken with the performance, that he said to Oswald, he would put the Duke of Buccleugh under the author's care, and would make it worth his while to accept of that charge. As soon as I heard this, I called on him twice, with a view of talking with him about the matter, and of convincing him of the propriety of sending that young nobleman to Glasgow; for I could not hope that he could offer you any terms which would tempt you to renounce your professorship: but I missed him. Mr. Townsend passes for being a little uncertain in his resolutions; so perhaps you need not build much on this sally.

"In recompense for so many mortifying things, which nothing but truth could have extorted from me, and which I could easily have multiplied to a greater number, I doubt not but you are so good a Christian as to return good for evil, and to flatter my vanity by telling me that all the godly in Scotland abuse me for my account of John Knox and the Reformation. I suppose you are glad to see my paper end, and that I am obliged to conclude with

"Your humble servant,
"David Hume."

Section 3.—*The "Theory of Moral Sentiments."*

The question which Dr. Smith undertook to investigate in the "Theory of Moral Sentiments," however little regarded in later times, had evidently attracted a very considerable share of attention in the early part of the last century. At the period when he applied himself to that investigation, it had been previously illustrated by some of the most ingenious and profound writers in our language. The inquiry into the nature and origin of virtue, had been treated of by the elegant and sublime Lord Shaftesbury, the logical and acute Bishop Butler, the eloquent and ingenious Dr. Hutcheson, and by Mr. Hume himself, in his celebrated treatise entitled "An Inquiry concerning the Principles of Morals."

If it be true, as Mr. Stewart has

said, and as Smith himself always declared, that he owed more to the "Political discourses" of Mr. Hume, in the "Wealth of Nations," than to any other work which had appeared prior to his time, it cannot be doubted that in the work before us he was as much indebted to the principles unfolded in Mr. Hume's "Inquiry." In their results, the difference seems only to be this;—that, whereas Hume had resolved our moral perceptions into a general and social affection, Smith had taken pains to trace them, in all cases, to an immediate sympathy with the individual acting or acted upon. Upon nearly all collateral and fundamental points they were perfectly agreed. They were equally decided in considering the question in the outset as one of fact, to be determined by the invariable nature and recorded sentiments of mankind in all ages—not as one in which it is competent to philosophers to establish a standard of virtue, as was attempted by Cudworth and Clarke, without reference to those sentiments, upon some preconceived dogma of immutable right, and the eternal fitness of things; or upon any deduction of a remote and contingent utility, according to the system of Paley and Godwin, and others of the same school. Mr. Hume had dismissed, with the contempt it deserved, the doctrine of those who had denied the reality of any distinction in morals. He had shewn by the most unanswerable reasoning that their origin was to be found in sentiment, not in the subtleties of abstract ratiocination; and has overthrown for ever, in the opinion of all who are capable of reasoning on such subjects, the selfish system of ethics, revived by Hobbes in the seventeenth century, who had borrowed it from the school of Epicurus, and who bequeathed it as a theme of everlasting cavil and epigrammatic paradox to that of Helvetius and Rochefoucauld, and their followers, in later days. Dr. Smith, though he makes little direct reference to this system founded on the absolute selfishness of man, may be considered as having stated and pronounced upon the question in the opening passage of his work:—"How selfish soever man may be supposed," says he, "there are evidently some principles in his nature which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it except the pleasure of seeing it; of this kind is pity or compassion, words appropriated to signify our fellow feeling with the sorrow of others." "Sympathy," he adds, "though its meaning was originally the same, may now, however, be made use of to denote our fellow feeling with any passion whatever." And upon this principle he erects his system.

It is not our intention, nor is it, indeed, within the limits of the present memoir, to attempt an analysis of this very beautiful production. A brief outline of the leading principles on which it rests may be stated as follows:—

Upon our disposition to sympathize with the passions and actions of other men, is founded our sense of propriety or impropriety—upon that of sympathizing with the motives which excite or produce those actions and passions, is founded our sense of merit or demerit; the disposition which prompts us to gratitude or resentment, to reward or to punish the agent. An application of the sentiments thus acquired by observation of the actions and character of others, to the affections and conduct of ourselves in the various relations of life in which we are called upon to act, to judge, or to suffer, gives rise to a new perception; namely, the sense of duty, the natural and final result of the joint operation of those faculties of the heart and the understanding, with which man was endowed by his Maker, and not a factitious principle of expediency, which it was left for him to deduce from the remote and contingent consequences of the actions themselves.

Of the questions which are discussed in the science of morals, the two principal are these:—What is the characteristic property of virtue or merit? And by what faculty or power are we made cognizant of its existence? In Hume's Inquiry upon this interesting subject, he involved the solution of the second question in investigating the first. Smith seems to have pursued a different course, and to have blended the first question in his discussion of the second. We have always considered that the scope of Mr. Hume's reasoning upon this point has been strangely misconceived. In shewing, as he did conclusively to our minds, that utility was an invariable attribute of all virtue, his argument was limited, and he obviously meant it to be limited to the simple establishment of the *fact;* to proving, that by the constitution of man, and the natural economy of his moral sentiments, there was no disposition of the mind, no action attended with the general approbation of mankind, which would not be found in its results beneficial to the species. He proved that nature had so constituted us, that by an involuntary sympathy we are formed to approve of these qualities even when we can have no personal interest in the case—nay, even when our personal interest may be opposed to the exercise of them. The sentiment or emotion thus excited, is the effect of a beneficent wisdom in the moral economy of man; an economy which proves the divine origin and government of the world even more cogently than the most exquisite of the merely physical arrangements so often adduced for the purpose. But having shewn this to be the fact, it never could be intended, by that accurate and profound thinker, to draw or to suggest the inference, that in pursuit of any imagined utility, any distant and general advantage which might present itself to his narrow capacity, it was competent for man to tamper with the order of God, and in neglect of the active impulses, the affections, and even the prejudices of his nature, which, by the direction of his wisdom, were made subservient to the most admirable ends—to erect a new *standard* of morals, and pretend to shew that that mode of action might be *expedient*, which his heart told him could never be *right*. But whatever doubts may exist as to the meaning of Hume, there can be none with regard to that of Dr. Smith upon this vital question; and it is in the admirable and really philosophical spirit which pervades and animates every part of his system, and this more especially, that we conceive the great excellence of his work to consist; for it may assuredly be said of it, that if it does not furnish the true "Theory of Moral Sentiments," there can be no hesitation in admitting that its author has, at least, pointed out the way in which that theory must be sought. Smith saw, and strictly adhered to the distinction, as Mr. Stewart has well remarked*, which has been too little adverted to by ethical inquirers—the distinction betwixt the final and the efficient cause in all our moral determinations. The chapter in which this fundamental point is more directly enforced must be considered as one of the finest portions of his book, exhibiting a specimen, perhaps, of the most refined and philosophical disquisition which human language has ever embodied. It lies so directly in our way, in the few observations we think it necessary to make upon this production of Dr. Smith;—it lies so much at the root of the main difficulty involved in the inquiry concerning the foundation of morals; the most interesting problem, perhaps, in metaphysics; it comes so strongly recommended in consequence to all who can take any interest in such discussions,—that we shall cite a part of it in this place, happy if, by accident, we should be the means in this way of introducing one of our readers to an acquaintance with the work in which it is to be found.

After having traced the growth of the emotions which arise from the spectacle of vice as well as of virtue, and having shewn that the resentment which we feel in the one case is the counterpart of the gratitude we feel in the other; and that it is this emotion which, constituting our immediate sense of demerit, prompts us to inflict the punishment which the well-being of society requires should be inflicted; and that the Author of Nature did not leave it to the slow and uncertain deductions of our reason to find out the means of attaining this end, but endowed us with an instinctive feeling of approbation of the very application most proper to attain it,—he proceeds to consider the "utility of this constitution of nature." "In every part of the universe," he says*, "we observe means adjusted with the nicest artifice to the end which they are intended to produce; and in the mechanism of a plant or animal body, admire how everything is contrived for advancing the two great purposes of nature, the support of the individual, and the propagation of the species. But in these, and in all such objects, we still distinguish the efficient from the final cause of their several motions and organizations. The digestion of the food, the circulation of the blood, and the secretion of the several juices which are drawn from it, are operations all of them necessary for the great purposes of animal life; yet we never endeavour to account for them from those purposes as from their efficient causes, nor imagine that the blood circulates, or that the food digests of its own accord, and with a view or intention to the purposes of circulation or digestion. The wheels of the watch are all admirably adjusted to the end for which it was made—the pointing of the hour: all their various motions conspire, in the nicest manner, to produce this effect. If they were endowed with a desire and intention to produce it, they could not do it better: yet we never ascribe any such desire or intention to them, but to the watchmaker; and we know that they are put into motion by a spring which intends the effect it produces as little as they do. But though, in accounting for the operation of bodies, we never fail to distinguish in this manner the efficient from the final cause,—in accounting for those of the mind, we are very apt to confound these two different things with one another. When by natural principles we are led to advance those ends which a refined and enlightened reason would recommend to us, we are very apt to impute to that reason, as to their efficient cause, the sentiments and actions by which we advance those ends, and to imagine that to be the wisdom of man, which is in reality the wisdom of God. Upon a superficial view, this cause seems sufficient to produce the effects which are ascribed to it, and the system of human nature seems to be more simple and agreeable when all its different operations are in this manner deduced from a single principle." After distinguishing in this way the efficient from the final cause of our moral impressions, our first perceptions of right and wrong,—after shewing that though it is absolutely necessary for the subsistence of society that the laws of justice should be observed, yet that it is not from a consideration of this necessity that we originally approve of their enforcement (though he admits that our regard for them may often be confirmed, and may sometimes require to be confirmed by such consideration),—he proceeds, "We frequently hear the young and the licentious ridiculing the most sacred rules of morality, and professing, sometimes from the corruption, but more frequently from the vanity of their hearts, the most abominable maxims of conduct. Our indignation rouses, and we are eager to refute and expose such detestable principles. But, though it is their intrinsic hatefulness and detestableness which originally inflame us against them, we are unwilling to assign this as the sole reason why we condemn them, or to pretend that it is merely because we ourselves hate and detest them. The reason, we think, would not appear to be conclusive. Yet why should it not; if we hate and detest them, because they are the natural and proper objects of hatred and detestation? But when we are asked, why we should not act in such or such a manner, the very question seems to suppose, that to those who ask it this manner of acting does not appear to be for its own sake the natural and proper object of these sentiments. We must shew therefore, that it ought to be so for the sake of something else; and the consideration which first occurs to us is the disorder and confusion of society which would result from the universal prevalence of such practices. We seldom fail therefore to insist upon this topic. That it is not a regard, however, to the preservation of society, which originally interests us in the punishment of crimes committed against individuals, may be demonstrated by many obvious considerations. All men, even the most stupid and unthinking, abhor perfidy and injustice, and delight to see them punished. But few men have reflected upon the necessity of justice to the existence of society, however obvious that necessity may appear. The concern which we take in the fortune and happiness of individuals does not, in common cases, arise from that which we take in the fortune and happiness of society. We are no more concerned for the destruction or loss of a single man, because the man is a member or part of society, and because we should be concerned for the destruction of society, than we are concerned for the loss of a single guinea, because this guinea is part of a thousand guineas, and because we should be concerned for the loss of the whole sum. In neither case does our regard for the individuals arise from our regard for the multitude; but in both cases our regard for the multitude is compounded, and made up of the particular regards which we feel for the different individuals of which it is composed. As when a small sum is unjustly taken from us, we do not so much prosecute the injury from a regard to the preservation of our whole fortune as from a regard to that particular sum which we have lost; so when a single man is injured or destroyed, we demand the punishment of the wrong that has been done to him, not so much from a concern for the general interest of society, as from a concern for that very individual who has been injured."

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* Philos. Hum. Mind, vol. ii.

* Theory of Moral Sent. vol. i. part ii. sect. 2.

In a subsequent part of his work, wherein he treats of the "Influence of fortune upon our Moral Sentiments," and shews that, though it is the intention or affection of the heart, the propriety or impropriety, the beneficence or hurtfulness of the design that all praise or blame which can be bestowed upon an action must ultimately belong; yet, nevertheless, the result of those actions, the actual consequences which often proceed from them, do materially affect our sentiments:—He traces, in the same admirable spirit, the final cause of this inconsistency in our judgments; and remarks that—"that necessary rule of justice, that men in this life are accountable for their actions only, not for their designs or intentions, is founded upon this salutary and useful irregularity in human sentiments concerning merit and demerit, which appears at first sight so absurd and unaccountable. But," he concludes, "every part of nature, when attentively surveyed, equally demonstrates the providential care of its Author; and we may admire the wisdom and the goodness of God even in the weakness and the folly of men."

We have the greater pleasure in citing these passages, because we think that we may read in them the best refutation of that theory of expediency, which nothing but the reputation of Dr. Paley could ever have recommended to the world*—a theory which Mr. Stewart has characterised in a strain of indignant eloquence, that well became him on such a topic, as one which, "absolving men from the obligations imposed upon them by the moral constitution of human nature, abandons every individual to the guidance of his own narrow views concerning the complicated interests of society†."

It may not perhaps be unworthy of observation, before we close these few remarks upon the "Theory of Moral Sentiments," that the same principle of sympathy as a source of morals, from which Smith has deduced his system, appears to have been referred to by Polybius, in a remarkable passage of his history, for the same purpose. It is rather long for a quotation; but as it is curious in itself, and as Polybius is not a writer in every one's hands, we shall transcribe part of it in a note below; when possibly it may appear, after all, that the coincidence is rather in expression than in substance, and that it applies rather more strikingly to the doctrine of *sympathy with utility*, (the theory of Hume) than to that of sympathy as unfolded by Smith*.

SECTION 4.—*From the publication of the "Theory of Moral Sentiments" to that of the "Wealth of Nations."*

WE have seen, from the letter which Mr. Hume addressed to our author, something of the impression which was produced by the publication of his first great work. We shall shortly perceive that the hope therein expressed, that it might lead to an interesting connexion with the Duke of Buccleugh was not idly formed. In the meantime, however, it made no change in the life and habits of Dr. Smith. He continued his professorship in the University of Glasgow for a period of four years after this, directing his attention, and that of his students, somewhat less to that department of ethics, of which he had presented to the world his views, and treating more particularly of the subjects which come within the range of jurisprudence, and political philosophy. Of the long and profound attention he had devoted to this latter branch of moral science, he has bequeathed an imperishable monument to the world in his "Wealth of Nations." His views upon the theory of jurisprudence, except inasmuch as he has embodied some of its important principles in that work, were confined to his lectures; though it is clear from an intimation conveyed in the closing paragraph of the "Moral Sentiments," and still more so from the advertisement he prefixed to the last edition of that work, written only a few months before his death, that it was a subject which, during the whole of his life, he had deeply meditated, and upon which he had always designed to communicate his labours to the public, if the engagements with which he was occupied during the latter period of it had not interfered to prevent him.

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* It may be allowed us to state in a few words what we have always considered to be the wide difference upon this great point, betwixt the doctrine of Mr. Hume and that of Dr. Paley, which it is surprising to see so often confounded. Hume proved from the phenomena of human nature as a *fact*, that whatever in moral conduct was intrinsically right, was useful. Paley laid it down as a *rule*, that whatever was expedient, was right; and thus converted a position of undeniable truth and beauty into an hypothesis full of fallacy, as the solution of a problem pregnant with evil in its consequences, when considered as a precept.

† Philos. Hum. Mind, vol. ii. Ch. 4, Sect. 6.

* "For man, who among all the various kinds of animals is alone endowed with the faculty of reason, cannot, like the rest, pass over such actions (ingratitude and injustice) with indifference; but reflecting on what he sees, and comparing the future with the present, will not fail to express his indignation at this injurious treatment, to which, as he foresees, he may at some time be exposed. Thus it is certain that all men must be shocked by such ingratitude through sympathy with the resentment of their neighbour, and from an apprehension also that the case may be their own. And from hence arises in the mind of man, a certain sense of the nature, and force of duty, in which consists both the beginning and the end of justice; and thus it is that the people begin to discern the nature of things, honourable or base, and in what consists the difference between them; and to perceive that the former, on account of the advantage that attends them, are fit to be admired and imitated, and the latter to be detested and avoided."—*Polybius*, Hist., Book vi. Ex. 1, Ch. i. Hampton's Translation.

For himself, Dr. Smith has undoubtedly done enough, and so far as regards his own interest and his fame, it would be idle to indulge in regrets. For the world however, and for the interests of science, perhaps a greater loss has been rarely sustained than in the unfortunate circumstances, whatever they were, which concurred to deprive it of this most valuable portion of his labours. The enlarged views he had evidently formed of the objects and principles of legislation; the glimpses which we occasionally catch in his other writings of the spirit in which he was accustomed to contemplate such subjects; the pure and lofty sources to which he was accustomed to refer for those principles; all assure us of the invaluable addition which would have been made to this department of philosophy, had it been illustrated by his pen.

From this, however, and from his academical labours generally, he was withdrawn in the year 1763, by an invitation to accompany the Duke of Buccleugh on his travels; an appointment which was principally recommended to him at the time, by the desire which he had conceived of visiting the continent. The proposal, which was made to him through Mr. Charles Townsend, was liberal in the extreme; as might be expected to be made to such a man, to induce him to quit the scene of his honourable and useful labours, the society of his friends, and those studious delights, known only to the pure and devoted lovers of truth, which constitute the highest charm of human existence.

It is well known that, whatever pleasure Smith might derive from his tour, or whatever advantage from his connexion with the noble family of Buccleugh, the separation from the university of Glasgow was a source to him of very heartfelt regret. An interesting and characteristic anecdote has been recorded of him, relative to his resignation of his duty as professor there, which is well worth preserving.

It was at the latter end of his course of lectures, that it became necessary for him to take his departure, and it was well ascertained that he had been at exceeding pains to provide, in a friend, a very competent successor for that part of the course which yet remained unfinished. He had suffered the greatest possible anxiety upon this point, and had done everything that might satisfy the most scrupulous of his friends and his pupils. This, however, did not satisfy the conscientious delicacy of Dr. Smith. He was of course aware of the high estimation in which he was held in the university, and the just value which was put upon his lectures. The day at length arrived when he was to address the students of his class for the last time, and it was a moment deeply affecting to both parties. He took leave of them in a tone of affection and regret, which enlivened their mutual sorrow; and when they were about to depart, he called them severally to his chair, and tendered to each of them, carefully folded in paper, the amount of the fee which he had received for the whole course of his lectures, notwithstanding so small a portion of it only remained unfinished. This was of course refused resolutely, as by acclamation; the professor, however, persisted in his endeavour, assuring them that he should not be satisfied otherwise, and that he should quit them under the impression of having failed in his duty, and of having wronged them, if they did not take back the fee for the entire course of lectures, which circumstances prevented him from completing. It was in vain that they assured him how far they were overpaid by the smallest portion of his labour bestowed upon them for the trifling emolument he derived; how real a wrong they should be committing to consent to such a proposal, and, in short, their firm determination by no means to listen to it. The professor was sensibly touched by their generous avowal, but he was not to be moved from his purpose. When they were at last on the point of quitting the lecture-room, he seized hold of the foremost of the students, and absolutely forced the money into his hands, exclaiming, with his accustomed ardour, "Nay, gentlemen, I will not suffer this; it is a matter of conscience with me, and I must have my way;" and in this manner seeing him so deeply concerned in his object, they were obliged to submit; and thus to terminate a struggle of very unusual occurrence, equally honourable to the delicacy and generosity of the professor, and the attachment of his pupils.

It may safely be said, without disparagement to the many eminent successors of Dr. Smith, that his removal from the chair of moral philosophy was perhaps the greatest loss which the University of Glasgow has sustained. Of his merits and his method as a lecturer, we have presented our readers with an interesting memorial in the last section; but there is a circumstance related of him which may still better serve to evince the pains and sagacity which he exerted in the performance of his duty, and may suggest a standing and instructive lesson to both public and private teachers in all times and places. It is said that in the delivery of his daily lectures, his observation had been drawn, in an especial manner, to a certain student of his class, whose general habit of close and riveted attention to what was going on, became a mark or indication to the professor of the degree in which he succeeded in the developement and expression of his subject—that he was accustomed to fix his eye upon the student in question, and as long as he found that he retained his hold of his attention, he felt satisfied; but whenever he remarked any relaxation in his manner, whether in the wandering expression of his countenance, or the position of his body, which seemed to indicate a diminishing interest in the lecture—"I took this as a valuable admonition," he used to say; "I was sure that there was something wanting either of connection in my reasoning or of sufficient fulness and perspicuity in my exposition, and I immediately paused. I recapitulated what I had been saying—I explained—I re-argued—I endeavoured further to illustrate my propositions, and I never felt quite satisfied that I was going on right, until I had regained complete hold of my monitor, till I saw by the resumption of his usual manner and gaze that I possessed the whole of his attention."

Having disengaged himself as well as he could from the ties that bound him to Glasgow, Smith quitted that city in January, 1764, and joined the Duke of Buccleugh in London, where they remained together a couple of months. In March they set out on their route to Paris, and had the fortune to be joined at Dover by Sir James Macdonald, who accompanied them as far as the French capital, where they parted;—Sir James on his way to Italy, where he died within two years after, in the twenty-fifth year of his age. Were there no other testimony to the merit of this accomplished person, it would be sufficient to shew that he enjoyed in so high a degree the esteem and admiration of two such men as Dr. Smith and Mr. Hume; and a letter which the latter addressed to Smith, on the occasion of his death, contains strong evidence of this—"Were you and I together," says he, "we should shed tears at present for the death of poor Sir James Macdonald: we could not possibly have suffered a greater loss than in that valuable young man."

It was about the same time when Smith set out for the continent with the Duke of Buccleugh, that his friend Hume had been invited to join the embassy of the Earl of Hertford at Paris. Smith remained in that city only a few days; but before he left it we should mention that he addressed the rector of the University of Glasgow in form, tendering his resignation of the chair he had filled, and expressing himself as might be expected on such an occasion.—"I was never more anxious" (he says, in the conclusion of his letter) "for the good of the college than at this moment; and I sincerely wish that, whoever is my successor, he may not only do credit to the office by his abilities, but be a comfort to the very excellent men with whom he is likely to spend his life, by the probity of his heart and the goodness of his temper." On the receipt of this letter, the chair was declared to be vacant; and at a meeting of the heads of the university the sense of the value of their late professor, and the loss sustained by his removal was recorded in the following terms:—

"The University cannot help expressing their sincere regret at the removal of Dr. Smith, whose distinguished probity and amiable qualities procured him the esteem and affection of his colleagues, and whose uncommon genius, great abilities, and extensive learning, did so much honour to this society: his elegant and ingenious 'Theory of Moral Sentiments' having recommended him to the esteem of men of taste and literature throughout Europe. His happy talent of illustrating abstracted subjects, and faithful assiduity in communicating useful knowledge, distinguished him as a professor, and at once afforded the greatest pleasure and the most important instruction to the youth under his care."

On quitting Paris, Dr. Smith and the Duke of Buccleugh proceeded to Toulouse, where they fixed their abode for a year and a half; enjoying the best society of the place, and finding in new manners and new modes of existence fresh sources of interest and information equally advantageous to both parties—to Dr. Smith affording opportunities of extending and confirming his previous acquaintance with men and books; and perhaps having the effect of biassing his judgment in some matters of taste and literature, rather erroneously, in favour of French criticism and genius, and of certain pre-conceived theories to which he was naturally inclined.

On quitting Toulouse, they spent the autumn of that year in a tour through the southern provinces of France and to Switzerland. At Geneva they remained a couple of months; and returned to Paris about Christmas 1765, where they continued till the month of October following.

It was at Paris, as we may well suppose, that Smith, after all, enjoyed by far the highest gratification which his journey afforded him. The capital, as Mr. Hume used to say, is the true scene for a man of letters; and if any, surely it was the capital of France at this period. Mr. Hume himself was there only for a short time after the arrival of his friend; but he was there long enough to introduce him to the most distinguished philosophers and men of learning then living in Paris:—D'Alembert, Helvetius, Marmontel, Turgot, Quesnai, and many others. The society of the two latter in particular we may be assured, from the congeniality of their sentiments upon subjects which Smith was at that time deeply meditating, must have been gratifying to him in a degree not very easy to conceive. It was that private and unreserved interchange of opinion in matters of moral and political science, with men like these, equally enlightened with himself, and animated by the same zeal for the happiness of mankind, that constituted his felicity; for, in other respects, the mere gaiety and brilliancy of Parisian society were not adapted to his taste and manners; nor were his powers in conversation such as fitted him to shine amid its glare.

With Turgot and Quesnai he contracted a very close intimacy. With the former it was long supposed that he maintained an epistolary correspondence for a long period after his return to Scotland, a circumstance which excited naturally considerable interest, but of which Mr. Stewart, who took some pains to inquire into it, found reason to doubt the truth. It is certain that no memorial of such correspondence existed amongst Smith's papers, nor has any been made public from those of Turgot. It is well known, indeed, that Smith had no fondness for letter-writing, nor are we aware of three letters of his which have ever appeared in print. As he wrote few letters, it is equally to be regretted that he kept no journal during his travels, or if he did, that it was amongst the other papers which he took such anxious pains to secure the destruction of previous to his death.

Amongst the other eminent persons with whom Smith became acquainted whilst in Paris, and from whom he received distinguished marks of respect, was the family of the Duke de la Rochefoucauld; a circumstance not unworthy of being recorded, inasmuch as his introduction to that accomplished and amiable man led to the suppression in the latter edition of his "Theory of Moral Sentiments" of a rather severe animadversion upon the author of the celebrated "Maxims," which had been expressed in the first, where Smith had associated the name of Rochefoucauld with that of Mandeville. There is a letter extant from the Duke de la Rochefoucauld dated in 1778, addressed to Smith, transmitting to him a new edition of the "Maxims," in which he adverts with some pain to Dr. Smith's censure, and offers a poor apology, though the best that can be made, for a very shallow and pernicious performance, which persons equally shallow have taken for philosophy, but which nobody would have thought it worth while to remember or refute, if it had not been written in epigrams. In France he studied the principles of the economists in their writings as well as in their conversations; and was perhaps first led by the errors of that ingenious and amiable sect, to the contemplation of the more wide and just views to which his mind was opening. The fine arts also and belles lettres, the poetry, and especially the drama of that country, subjects well worthy the contemplation of the philosopher, engaged no small share of his attention. The imagination and the arts which are addressed to it; the refined pleasures of which it is susceptible, and the taste to appreciate those pleasures, were then deemed not unworthy the attention of a philosopher. The principles upon which the arts are founded, the origin and nature of the emotions they excite, and the causes which, in different ages and nations, have diversified their character and operation, are subjects which were not only supposed to have some interest in themselves, but which have been investigated by such metaphysicians and economists as Hume and Smith, and Berkeley and Dugald Stewart, from the intimate and indissoluble connexion which they hold with the philosophy of the human mind; and as embracing an extensive and beautiful class of phenomena which form part of the great science of human nature. We are pleased to record such things in the character of Smith; because, however unimportant at other times, they are of consequence now, when one of the first of sciences is in danger of suffering in public estimation from the narrow and repulsive spirit which is occasionally mingled in its discussions: and because they shew that political economy, as a study, is not incompatible with a love of literature, and eloquence, and poetry; and assuredly not so with good taste and good writing*.

Dr. Smith's own taste in literature, as has been already hinted, was disposed to the admiration of what has been since denominated the classical, in contradistinction to the romantic, school of art. We do not remember, at this moment, a single reference to Shakspeare in the whole of his writings; while the lofty praise he has taken occasion to bestow upon the tragedies of Racine and Voltaire, his allusions to Pope, and encomium on Gray, exhibit more positive testimony in proof of this taste. But reserving what we have further to say respecting his general intellectual character and literary taste, for the conclusion of our memoir, we proceed to detail the few remaining incidents of his life.

In October, 1766, Dr. Smith returned to London, where he and the Duke of Buccleugh separated; after having spent three years together, without the slightest coolness or disagreement; and, "on my part," says the Duke, in a letter which he addressed to Mr. Stewart, "with every advantage that could be expected from the society of such a man. We lived in friendship till the hour of his death; and I shall always retain the impression of having lost a friend whom I loved and respected, not only for his great talents, but for every private virtue."

Shortly after his return to England, he went down to his native place, where he continued to reside almost uninterruptedly for the next ten years of his life. An occasional visit to his friends at Edinburgh, with a journey to London once or twice in the interval, were his only diversions from a course of intense application. To his friends, to Mr. Hume in particular, this severe seclusion was a frequent matter of regret and complaint. Hume had returned to Edinburgh in 1669, after quitting his engagement with Lord Hertford; and in a letter written shortly after to Smith, he says, (dating from his house in St. James' Court, which commanded a prospect of the Forth and the opposite coast of Fife)—"I am glad to have come within sight of you; but as I would also be within speaking terms of you, I wish we could concert measures for that purpose. I am mortally sick at sea, and regard with horror and a kind of hydrophobia the great gulph that lies between us. I am also tired of travelling, as much as you ought naturally to be of staying at home; I therefore propose to you to come hither, and pass some days with me in this solitude. I want to know what you have been doing, and propose to exact a rigorous account of the method in which you have employed yourself during your retreat. I am positive you are in the wrong in many of your speculations, especially where you have the misfortune to differ from me. All these are reasons for our meeting, and I wish you would make me some reasonable proposal for that purpose. There is no habitation in the island of Inchkeith, otherwise I should challenge you to meet me there, and neither of us ever to leave the place till we are fully agreed on all points of controversy. I expect General Conway here to-morrow, whom I shall attend to Roseneath, and I shall remain there a few days. On my return, I hope to find a letter from you, containing a bold acceptance of this defiance."

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* It is but justice to say here, that we are most happy to except from any censure implied in the above observations, two distinguished professors of political economy—we mean, Mr. Senior of Oxford, and Mr. Macculloch of the University of London—both of whom have invariably written and spoken in the spirit of their great master.

There are extant several letters from this celebrated person, in which he exhorts his friend to leave his retirement, in terms expressive at once of the fondest friendship, and the most longing desire for his society: "I shall not take any excuse from your state of health," he writes on another occasion, "which I suppose only a subterfuge invented by indolence and love of solitude. Indeed, my dear Smith, if you continue to hearken to complaints of this nature, you will cut yourself out entirely from human society, to the great loss of both parties."

During the whole of this period, Smith may be considered as engaged in the composition of his great work. The room is still shewn at Kirkaldy, in which was written the greater part of the "Wealth of Nations;" and to that, and to scenes ennobled in like manner, by the exertions of genius and learning, will mankind some day make their pilgrimage in devotion to science and to virtue, when the shrines of kings and conquerors shall attract the homage which is often paid to them as little as they deserve it.

In the spring of the year 1773, he went up to London for rather a longer period than he was in the habit of leaving home; partly for the purpose of collecting some information, and making references relative to the work which now engrossed his whole thoughts.

There are so few letters of Smith's extant, as we have before observed, that we shall not hesitate to present to our readers the following, which he addressed to Mr. Hume on the point of his departure, as it serves to shew the extreme anxiety which he always felt about the destruction of his manuscripts:—

"*Edinburgh, April* 16*th*, 1773.

"My dear Friend,

"As I have left the care of all my literary papers to you, I must tell you, that, except those which I carry along with me, there are none worth the publication but a fragment of a great work, which contains a history of the astronomical systems that were successively in fashion down to the time of Des Cartes. Whether that might not be published as a fragment of an intended juvenile work, I leave to your judgment; though I begin to suspect that there is more refinement than solidity in some parts of it. This little work you will find in a thin folio paper in my back room. All the other loose papers, which you will find in that desk, or within the glass folding doors of a bureau in my bedroom, together with about eighteen thin folio books, which you will likewise find within the same glass folding-doors, I desire may be destroyed without any examination. Unless I die very suddenly, I shall take care that the papers I carry with me shall be sent to you.

"I am ever, my dear Friend,

"Most faithfully yours,

"Adam Smith."

The memorable year 1776 was now approaching, memorable in the life of Smith, as it was in the spring of that year that he gave to the world his immortal work, the "Inquiry into the Nature and Causes of the Wealth of Nations," and in the autumn that death deprived him of his immortal friend, Mr. Hume.

Smith was in London at the time of the publication of his book; and the highest gratification, perhaps, afforded him on that occasion—higher, perhaps, than any which the praises of the world could give—was conveyed to him in the following letter, addressed to him by his dying friend. It was written from Edinburgh, only a few days before he set out on his journey to the South, as the only remaining hope of preserving his life; and testifies, almost in his last moments, the same amiable solicitude for his friends and their fame which characterised him throughout the whole of his existence. The letter is dated April 1, 1776—"Euge Belle! Dear Mr. Smith—I am much pleased with your performance, and the perusal of it has taken me from a state of great anxiety. It was a work of so much expectation by yourself, by your friends and by the public, that I trembled for its appearance, but am now much relieved. Not but that the reading of it necessarily requires so much attention, and the public is disposed to give so little, that I shall still doubt for some time of its being at first very popular. But it has depth, and solidity, and acuteness, and is so much illustrated by curious facts, that it must at last take the public attention. It is probably much improved by your last abode in London. If you were here, at my fireside, I should dispute some of your principles. But these, and a hundred other points, are fit only to be discussed in conversation. I hope it will be soon, for I am in a very bad state of health, and cannot afford a long delay."

It was but a few months after the publication of "The Wealth of Nations," when the death of Mr. Hume gave occasion to one of the most memorable and honourable incidents in the life of Smith. Attached as they had been for years, by ties of no ordinary kind; revering and loving the friend of his life, for moral and intellectual qualities, rarely found apart, and still more rarely united, congenial in their sentiments upon every subject perhaps, save one—a difference upon which could create no abatement in the affections of two such men—Smith felt himself called upon, his heart yet bleeding under the loss he had sustained, to defend from calumny, now that he was dead, him, whom while living she had "never touched or attacked with her baleful tooth."*

It is well known that, from the nature of some of Mr. Hume's speculative opinions, coupled with the high celebrity of his name, his death had attracted no small degree of attention. It is known, too, that far more of zeal than charity had been displayed in a variety of rumours, equally false and absurd, which had been circulated relative to that melancholy event—calumny which, as we have said, had watched her hour, now poured forth her venom; and stories of death-bed horror and remorse, and agony and confession, were current through the land. It was easy to smile at all this; but it was felt to be due to the virtues of the man—to the benevolence of his affections and the unsullied purity of his life, to state the simple fact, that Mr. Hume's deathbed had betrayed no remorse whatever. Smith undertook to do this, undeterred by the obvious risk of incurring the odium of sharing the opinions of his friend, on the only subject perhaps on which they differed.

A few months only previous to his death, Mr. Hume had drawn up that brief but characteristic memorial of himself, entitled "My Own Life," and had left the care of its publication to Dr. Smith. To this memoir Smith appended his celebrated letter addressed to Mr. Strahan, for the purpose, as he says, "of giving some account of the behaviour of their excellent friend during his last illness." The letter commences, therefore, where Hume's own account had ended; and having described the unruffled serenity of his mind and temper throughout the whole of his rapid decline—"his cheerfulness so great that his friends could not regard him as a dying man"—even to the last hour "so free from the smallest anxiety or low spirits that he never dropped the smallest expression of impatience, but when he had occasion to speak to those about him, doing it with the utmost affection and tenderness," and "that he died in such a happy composure of mind that nothing could exceed it."—He closes with the following passage, which we hesitate not to transcribe in this short memorial, (as we should have done the entire letter if our limits would admit,) because it is a greater honour to the writer than the subject; and because it is quite certain, that if there is one page from the pen of Smith that he would himself have desired to perpetuate, it this tribute to his friend, although it may be suspected that the warmth of friendship has somewhat overcharged the eulogy:—"Thus died," says he, "our most excellent and never to be forgotten friend, concerning whose philosophical opinions men will, no doubt, judge variously; every one approving or condemning them according as they happen to coincide or disagree with his own; but concerning whose character and conduct there can scarce be a difference of opinion. His temper, indeed, seemed to be more happily balanced, if I may be allowed such an expression, than that perhaps of any other man I have ever known. Even in the lowest state of his fortune, his great and necessary frugality never hindered him from exercising, on proper occasions, acts both of charity and generosity. It was a frugality founded not upon avarice, but upon the love of independency. The extreme gentleness of his nature never weakened either the firmness of his mind or the steadiness of his resolutions. His constant pleasantry was the genuine effusion of good nature and good humour, tempered with delicacy and modesty, and without even the slightest tincture of malignity, so frequently the disagreeable source of what is called wit in other men. It never was the meaning of his raillery to mortify, and therefore far from offending, it seldom failed to please and delight even those who were the objects of it. To his friends, who were frequently the objects of it, there was not any one, perhaps, of all his great and amiable qualities which contributed more to endear his conversation. And that gaiety of temper, so agreeable in society, but which is so often accompanied with frivolous and superficial qualities, was in him certainly attended with the most severe application, the most extensive learning, the greatest depth of thought, and a capacity in every respect the most comprehensive. Upon the whole, I have always considered him, both in his lifetime and since his death, as approaching as nearly to the idea of a perfectly wise and virtuous man, as perhaps the nature of human frailty will permit."

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* Hume—"My Own Life."

The effect of such a testimony, from such a quarter, was to put to silence, and it is to be hoped, in a great measure to put to shame, the disgraceful cry which had been set up; yet it did not do so altogether. Some there were who still joined in it, and taking advantage, as might have been foreseen, of Smith's generous zeal, attempted to heap upon the living that obloquy from which he had rescued the dead. Dr. Horne, afterwards Bishop of Norwich, published a letter addressed to Dr. Smith, in which the spirit of the theologian is much more conspicuous than that of the Christian, veiled as it was under an affectation of humour and irony, that ill concealed the bitter feelings in which it originated. To this publication of Dr. Horne, Dr. Smith did not deem it at all necessary that he should make any reply. He felt that he had done enough, and that it would have been equally unworthy of himself and his cause, to have commenced a controversy with Dr. Horne upon the merits, personal or philosophical, of David Hume.*

SECTION 5.—*The "Inquiry into the Nature and Causes of the Wealth of Nations."*

It will scarcely be considered an exaggerated praise to say, that the "Wealth of Nations" may be regarded as, perhaps, the most valuable acquisition which was made to philosophy and to science in the eighteenth century. It is of course quite beyond the limits of this memoir to offer an abstract or analysis of this great work. But, as in reference to the "Theory of Moral Sentiments," it was deemed proper to say a few words upon the subject itself of which it treats, and upon the leading principle of that theory; so it may be allowed us to offer a very few observations, in the same manner, upon the "Inquiry into the Nature and Causes of the Wealth of Nations," unquestionably the greatest production of Smith's genius.

In the closing passage of the "Moral Sentiments," he had promised, in some future work, to give an account of the general principles of law and government, and of the different revolutions they have undergone in the different periods of society; not only in what concerns justice, but *in what concerns police, revenue, and arms, and whatever else is the object of law; and to trace, in this way, those invariable principles which ought to run through, and be the foundation of the laws of all nations.*

In the "Wealth of Nations" he undertook to redeem this pledge, as far as regards police, revenue, and arms, by tracing the source, and nature, and progress of national wealth.

The fundamental principle, dimly conceived indeed, but never established and insisted upon before, upon which Smith raised, as upon a rock, the Science of Political Economy, was, that *labour is the source and origin of all wealth.* "Labour," says he, "was the first price, the original purchase money that was paid for all things. It was not by gold or by silver, but by labour, that all the wealth of the world was originally purchased;" and the mode by which the labour of man can be rendered most productive to his use and happiness is the problem to be solved by the economist.

Now the great cause of the increase in the productive powers of labour is found to consist in the *division* of labour—a division which arises in the first instance from the obvious suggestions of nature, and which, by giving birth in its progress to the institution of the various arts, trades, and professions which exist in every advanced state of society, occasions that universal opulence which extends itself to the lowest ranks of the people.

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* Having acknowledged our obligation to Mr. Stewart in the opening of this Memoir, it is only right that we should observe, that for several of the incidents which will be found in in it, we are not indebted to that eminent person; and that amongst other circumstances in the very barren life of Dr. Smith, of which he has made no mention, this very remarkable one of his conduct upon the death of Hume has been passed over in silence. For this omission we can be at no loss to account: it was dictated by the amiable solicitude for his friend's memory; and the apprehension that it might suffer from a revival of the asperities which his friendly zeal had excited. But a regard for truth prevents us from making a like omission.

But the effects of this principle have never in any society, or in any age of the world, been seen in their full extent, owing to the unjust and impolitic regulations which governments and legislators have at various times devised to control and thwart its operation. Instead of allowing every man to pursue his own interest in his own way, no society has ever yet been seen in which, from false views of policy, or from worse motives, extraordinary restraints have not been laid upon some branches of industry; while extraordinary privileges, equally injurious in their result, have been bestowed upon others.

In how different a spirit was conceived and executed the great work before us, is exhibited in every page. Smith aimed at, and he has succeeded in reducing that to a science, which had before been a succession of contrivances and devices, where no principle was ever referred to, and in which it was long supposed that science and principle could have no place*. The origin and continuance, indeed, of many of the most barbarous and oppressive institutions which tend to repress the energies of mankind, are to be traced very often to accidents, expedients, and prejudices, which belong as much to the people who are made to suffer from them, as to the laws and rules which have sometimes been the mere instruments of their establishment. To correct the policy of both was the object, and will be the lasting consequence, of his book. It was not by framing new forms of government, but by enlightening the policy of actual legislators, (as Mr. Stewart has well remarked,) that Dr. Smith, and other distinguished men of the last and present age, have attempted to ameliorate the condition of society. He endeavoured to shew, in one important branch of legislation, how much of the evils which affect its prosperity may be remedied by wise policy, and how much is the result of those higher and unalterable laws, by which the course of human affairs is determined, and the operation of which, since they cannot be controlled, must be patiently endured.

An illustration of this may be found in that important part of his work wherein he treats of the causes which determine the rate of wages. When the economist describes, for instance, the manner in which the value of labour is affected by the combination laws, the apprentice laws, and the law of settlement,—he explains the mischief produced in all cases by their operation; in the injury sustained under them by the labourer himself, from their evident violation of that natural liberty and justice which is his right; in the inequality which they occasion in different departments of industry, and in different places, from their interference with that essential order and prosperity which would otherwise ensue from allowing every man, as long as he observes the rules of justice, to pursue his own interest in his own way. Thus far of the inexpediency and absurdity of such arrangements with respect to society at large; and of the influence which bad regulations or injurious laws may have in affecting the condition of the labourer, and that of the community of which he forms a part. But, when he comes to explain how, under all circumstances, and in every society where even the rights of individuals are most respected by the spirit of its government and its legislation, the general rate of wages must always depend upon the relative quantity of labour seeking employment, and of capital having employment to give: that it is a law of economy, resulting from a law of nature, that where labour is superabundant in proportion to capital, there it will necessarily be cheap; or, in other words, wages will be low—and that, on the contrary, where capital accumulates rapidly, and exceeds the supply of labour in the market, there labour will be dear, or, in other words, that wages will be high—when he has deduced this vital and important truth, and suggested thereby to the labourer, that on himself must mainly depend his ultimate prosperity, and that his condition for better or for worse is determined in this way by laws with which no human legislation can interfere, except in the removal of restrictions and prohibition, the political philosopher has done more for the peace and good order of society; and more to remove the sources of ill will, and promote a right understanding of their relative position and duties in its different members; between labourers and their employers, between subjects and their government—more than can be achieved by the force of exhortation in a hundred volumes, or the force of power in a hundred armies.

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* Even the capacious mind of Mr. Fox is said to have been sceptical with regard to some of the truths unfolded by Adam Smith; and within a much more recent period, we may remember that an illustrious statesman, now no more, spoke in Parliament, of the "application of philosophy to politics" as a thing having the air of paradox, and which it required a tone of apology to refer to.

But the complete development of the principle of the division of labour, it must be borne in mind, requires that the fullest and freest scope be allowed to competition, which is, in other words, the entire freedom of commercial intercourse. What the inhabitants of the different provinces of a great kingdom are to each other by the division of their employments, and the interchange of their commodities; so are the various people of the different countries of the globe. They are all bound together by the same great law, the use and benefit which they may derive from the exercise of each other's skill, and the produce of each other's labour; and this economy of nations would be as obvious as it is in the case of a single people, if bad politics, springing out of bad passions; if ambition and the love of conquest, and the glare of military glory, which compose for the most part the history of nations, had not blinded men to their true interests, and corrupted the common sense and virtue of mankind.

To recommend this unlimited freedom of commercial intercourse; to shew how the restrictions which have been put upon it have in all cases defeated the object in view, and must continue to do so from the nature of things; to shew that the ordinary impulses we obey in pursuance of our own selfish interest, and which might seem to have no other end, are made, by the wise order of the great Author of our being to point far higher, and to be conducive in their results to the good of the society, as much as to that of the individual, or even more so, (for the advantage we plan for ourselves often escapes us, when that to society remains;) to shew, in the intercourse of nations as of men, "that *true* self love and social are the same," and that mutual wants, by the all-wise economy of Providence, were made to minister to mutual happiness;—that the instinctive desire by which every man is actuated, of improving his own condition (laws and government having no other province than that of taking care that, in pursuit of this end, he trenches not on the right of his neighbour), is the simple but solid basis on which has been reared and secured the everlasting progress of nations in every age:—Such were the enlightened doctrines which it was the purpose of Smith's work to enforce; and it is obvious that all legislation which proceeds upon an ignorance or contempt of these laws, is to the body politic, just what the prescriptions of a physician would be to the natural body, who knew nothing of the animal economy, its functions, or its structure.

As in the "Theory of Moral Sentiments," in treating of the moral constitution of man, he had been careful to distinguish the efficient from the final cause of our passions; he carried the same enlightened philosophy into all his investigations of human affairs, and shewed, as he beautifully expresses it, "that what is taken for the wisdom of man, is in reality the wisdom of God." There are numerous passages in his writings in which he inculcates the same sentiment, and enlarges on the folly of those speculators, who, in disregard of that wisdom, are constantly aiming to modify, by positive institutions, the natural order of society according to some arbitrary standard, instead of allowing it to advance in that course which is sure to conduct it, in the end, to the highest state of advancement of which it is susceptible. "Man," says he, in one of his early unpublished manuscripts, "is generally considered by statesmen and projectors, as the materials of a sort of political mechanics. Projectors disturb nature in the course of her operations in human affairs, and it requires no more than to let her alone, and give her fair play in the pursuit of her ends, that she may establish her own designs." "Little else," he adds, in another passage of the same paper, "is requisite to carry a state to the highest degree of opulence from the lowest barbarism, but peace, easy taxes, and a tolerable administration of justice; all the rest being brought about by the natural course of things. All governments which thwart this natural course, which force things into another channel, or which endeavour to arrest the progress of society, at a particular point, are unnatural, and to support themselves are obliged to be oppressive and tyrannical."

It is in this spirit that political economy must be studied, if it is to maintain that rank among the moral sciences which it deserves, and in which it was placed by its founder. It would, undoubtedly, be unfair to deny that anything has been added to this science since the publication of the "Wealth of Nations." But if it were admitted that some errors of Smith have been pointed out by subsequent inquirers, it will hardly be allowed that one or two corrections of doctrine in particular points make anything like amends for what political economy has lost of late in public estimation by the different spirit which has dictated, and the different tone which has breathed through some publications of a more recent date. The subjects of which this science treats have occupied a very increased degree of the attention, in the last few years, of speculative men, of all parties. They have done more than this. The science has attracted the attention of public men and statesmen. It has been referred to in parliamentary discussions; and what would have been most gratifying to its great expounder, some of its leading principles have been recognised and acted upon in important, and we trust, in permanent legislative enactments. There has been mixed up with these debates, it is true, much that might have been well spared, without loss to the credit of the assemblies in which they have taken place, and much interested and ignorant opposition has been arrayed against every amendment of the law; but nothing has been said or done by the most ignorant and most interested opponent of the progress of sound, political, and commercial freedom, which would so much have grieved the author of the "Wealth of Nations," as the arrogant and intolerant spirit, the daring paradox, and dogmatical propositions which have been promulgated by some of his pretended followers.

It is not needful to say more upon this point; but we think it requisite to say so much, for the benefit of those who know nothing of the "Wealth of Nations," and nothing of political economy; and in order that they may not be turned away by any spurious disciples of the science, from the study of a work, of which it has been truly said,—"that, abstracting entirely the author's peculiar and original speculations, there is no book, perhaps, in any language, containing so methodical, so comprehensive, and so judicious a digest of all the most profound and enlightened philosophy of the age."

The title which Smith adopted for his work, admirable as it is, and expressive of the nature of his investigations; and the introduction, in which he presents a luminous outline of his method, give no indication of the many masterly collateral disquisitions contained in it; because, in so comprehensive a subject, it was not easy to express, nor is it always obvious for the reader to perceive, the reference they bear to the investigations with which they are associated. These disquisitions, however, form very often the most interesting and valuable portion of the book, to those especially who, having less relish for the study of some branches of political economy, are pleased when they find its reasonings made applicable to purposes of more general philosophy. We would instance the whole of the first chapter of the fifth book, as being of this description; and more especially Art. II. and III. of Part the 3rd, entitled, "Of the Expense of the Institutions for the Education of Youth, and of the Expense of the Institutions for the Instruction of People of all Ages."

It may be remembered too that in every science, the most important and interesting truths are very often such as are obvious to every capacity, and when clearly stated admit of no dispute; whilst those parts of it which are least valuable, and most liable to angry controversy, are happily such as comprise doctrines purely speculative, and which, if they are of difficult comprehension, may be safely left uncomprehended. Now, if this is true of any science, it is true of political economy: there are thorny and vexatious questions included within its range, but we doubt if, in any of the moral sciences, there are so many well ascertained truths of great and practical importance which may fairly be said to lie, with candid reasoners, beyond the reach of controversy.

SECTION 6.—*From the publication of the "Wealth of Nations" until the death of Dr. Smith.*

THE two following years after the publication of the "Wealth of Nations" were spent chiefly in London; and Dr. Smith, as well he might, after ten years almost unremitting and severe application, relaxed his powers in the pleasures of society, and mingled with the many eminent men who were then at the head of wit and literature in the capital. Dr. Johnson, Burke, Gibbon, Beauclerk, Reynolds, and the other members of the

Literary Club, which had been formed many years before, and of which Smith had been previously a member, were among those with whom he associated at this time; but neither history nor tradition has handed down to us any of those sallies of colloquial wit and eloquence for which many of his contemporaries, far less distinguished than himself in the higher walks of philosophy and learning, have become celebrated with posterity. That he was not distinguished by the flow or force of his mind in conversation is quite evident; and he is reported to have said of himself, that he was so much in the habit of husbanding his resources for his works in the closet, that he made it a rule never to talk in society upon any subject which he understood. This story, however, we should be inclined to disbelieve. Such voluntary and deliberate abstinence from the pleasures of social converse, even if it were allowed to be a virtue, would evidently be one very difficult in practice; and instead of allowing him the credit of so rare a species of self-denial, we are more disposed, in accounting for his habitual reserve, to class Dr. Smith with some other very eminent men (Addison and Dryden are amongst them), whom Johnson has so admirably described in the following passage:—

"There are men whose powers operate only at leisure and in retirement, and whose intellectual vigour deserts them in conversation; whom merriment confuses, and objection disconcerts; whose bashfulness restrains their exertion, and suffers them not to speak till the time of speaking is past; or whose attention to their own character makes them unwilling to utter at hazard what has not been considered, and cannot be recalled."*

The light in which the characteristic quality of his mind was regarded by his friends may be partly gathered, amongst other testimonies, from the allusion to him in the verses which Dr. Barnard addressed to the members of the club, not long after the publication of the "Wealth of Nations." The stanza is as follows:—

If I have thoughts, and can't express 'em,
Gibbon shall teach me how to dress 'em
In words select and terse:
Jones teach me modesty and Greek,
Smith how to think, Burke how to speak,
And Beauclerc to converse.

In the year 1778, owing to the friendship of the Duke of Buccleugh, and in some measure, we may trust, as a reward for his invaluable labours, Dr. Smith was appointed one of the Commissioners of the Customs in Scotland; an office which occasioned him to fix his residence in Edinburgh, where he continued to the end of his life.

If we should consider this appointment only in the light of an acknowledgement, of a recompense too rarely bestowed by men in power, for labours purely philosophical, and having nothing to recommend them but their intrinsic truth and beauty, few things can be more gratifying than the contemplation, to every lover of science and of virtue. Even the rewards which have been occasionally bestowed upon men of genius, by princes and their ministers, have too often been conferred for its prostitution to the mere purposes of power; the price of its past or future service, or the bribe for its silence when that alone was to be bought.

In the instance before us, it is gratifying to know, that the reward, if it was so meant, was equally honourable to the giver and the receiver. The works which Smith had published for the instruction of the world, had nothing to do with the possessors of power in his day, but to enlighten and direct its exercise. The parties and factions belonging to the period when he wrote could derive no particular or personal advantage from his writings; but mankind, in every age, will find in them the best corrective to faction and to party, by contemplating those eternal political truths with which party has rarely had anything to do, but which are equally salutary at all times, and under every form of government, for rulers and their people.

But if we should consider that the appointment which was bestowed upon Smith, however gratifying in other respects, was the cause, as there is reason to fear, of an interruption to his studies, and of the loss to the world of those speculations to which he had alluded in the closing passage of his Moral Sentiments, and the completion of which he is known never to have entirely abandoned but with his life; we shall be disposed to lament, perhaps ungratefully to lament, that he who had already done so much for the advancement of moral and political science, was not permitted to do more, by the fulfilment of his engagement to give to his country a theory of jurisprudence, and in this manner to finish the structure which he had designed in his earlier days, and to fill up the measure of his fame. There is the greater reason to lament this, because the office imposed upon this enlightened man was one of no dignity or importance; but a duty of mere routine, the discharge of which must have been irksome to a mind like his, accustomed during his life to so different an application of his faculties. He might have been called, like Turgot, to the administration of his country, have enjoyed the melancholy satisfaction of endeavouring to enforce the maxims he had taught, and have found, perhaps, like him in the end, that the intrigues of the cabinet, the favour of the court, and the prejudices of the people, are equally adverse to the temper and the triumph of philosophy.

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* Life of Dryden.

It was about this period that his friend and early patron, Lord Kames, in preparing a new edition of his work on the "Principles of Morality and Natural Religion," was induced to call in question the theory of Dr. Smith, and he therefore sent him a copy of the strictures he intended to introduce upon his work, before he proceeded to publication. To this Smith replied in the following letter, which we hesitate not to subjoin,—first, because, as we have before remarked, there are so few of his letters extant, and secondly, as it serves to shew the courtesy with which philosophic controversy was carried on in those days, and would generally be carried on, if the love of truth, and truth only, inspired it.

"*November* 16*th*, 1778.

"My Dear Lord,

"I am much obliged to you for the kind communication of the objections you propose to make in your new edition, to my system. Nothing can be more perfectly friendly and polite than the terms in which you express yourself with regard to me; and I should be extremely peevish and ill-tempered if I could make the slightest opposition to their publication. I am, no doubt, extremely sorry to find myself of a different opinion both from so able a judge of the subject, and of so old and good a friend;—but differences of this kind are unavoidable, and besides—*Partium contentionibus respublica crescit.* I should have been waiting on your Lordship before this time, but the remains of a cold have, for these four or five days past, made it inconvenient for me to go out in the evening. Remember me to Mrs. Drummond, and believe me to be, my dear Lord, your most obliged,

"And most humble servant,

"Adam Smith."*

The greatest good conferred upon Dr. Smith by his official appointment, the greatest, indeed, that could be conferred by any additional wealth, was the power of extending the range of his benevolence, which is known to have been at all times exerted in acts of charity, far beyond what might have been expected of him, even after this moderate increase of his income. His excellent biographer has alluded to some remarkable instances of this nature in the life of Smith, which have been communicated to him by one of his confidential friends, where the assistance was on a scale as liberal as the manner of rendering it was delicate and affecting. Next to this was the satisfaction he derived from the privilege of spending the latter period of his life in the society of his oldest and dearest friends—free from those anxious cares with which the want of mere worldly competence has sometimes darkened the declining years of genius and of virtue. In the society of his mother, and of his cousin, Miss Douglas, who now formed part of his household, he enjoyed for some years every comfort and consolation that can be felt by one who is a stranger to the more endearing ties which bind a husband and a father. A simple, but hospitable table was always open to his friends.

In 1784 he lost his mother, and four years after, his cousin; and their death was felt by him as a severe and irreparable loss; little to be soothed by any worldly honour or applause; it being the effect, perhaps, of age and of all true wisdom, to render the mind as insensible to such vanities, as it is to dispose it to the influence of the social and domestic affections. Were it otherwise, the affliction under which he suffered might have been somewhat alleviated by one of the most gratifying circumstances of his life, which occurred about this period. In the year 1787 the University of Glasgow elected him rector of that learned body; and that he felt this compliment very sensibly, is manifest from the letter which he addressed to the principal of the college in acknowledgment of this flattering distinction—an honour, however, be it remarked, which could scarcely have been rendered where it would have reflected back so much credit upon those who had bestowed it, and which, we may venture to say, would not have been lessened in the estimation of Dr. Smith, had he lived to see it conferred upon some illustrious names who have shared it in our own times.

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* There is a letter of Dr. Reid's extant, addressed to Lord Kames, in which he says that "after all, the system of sympathy is only a refinement of the selfish system," a criticism very like to saying that white is only a refinement on the colour of black—things, in which the plain sense of the world has discovered, some how or other, a pretty clear and durable distinction; notwithstanding the painter may blend them with his brush, or a logician, like Dr. Reid, confound them by his cavils.

"No preferment," says he, "could have given me so much real satisfaction. No man can owe greater obligations to a society than I do to the University of Glasgow. They educated me; they sent me to Oxford. Soon after my return to Scotland, they elected me one of their own members, and afterwards preferred me to another office, to which the abilities and virtues of the never to be forgotten Dr. Hutcheson had given a superior degree of illustration. The period of thirteen years which I spent as a member of that society, I remember as by far the most useful, and therefore as by far the happiest and most honourable period of my life: and now, after three-and-twenty years absence, to be remembered in so very agreeable a manner by my old friends and protectors, gives me a heartfelt joy which I cannot easily express to you."

The life of this illustrious man was now fast drawing to a close. For a considerable period previous to his death his health had gradually declined, and his mind reverted in his last moments with renewed regret to what he had left undone of the works he had so long designed. His death was approaching far too rapidly to leave the slightest hope of doing more; and his anxiety about the fate of his manuscripts became excessive. It was so great, that during his last illness, after reiterating the most earnest entreaties for their destruction after his death, he was yet not satisfied, and desired that the whole of his papers, except the few fragments which he bequeathed to the care of Dr. Hutton, might be destroyed immediately. His mind seemed greatly relieved, when he was assured that this was done. A very few days before he died, he had two or three of his select friends to sup with him, as was his custom; but finding his strength fail him, he retired to bed, and as he went away, he took leave of them by saying, "I believe, Gentlemen, we must adjourn this meeting to some other place." In the previous winter he had prepared a new edition of his "Moral Sentiments," and in the advertisement which he prefixed to it, he had still allowed himself to express a last and faint hope that it might yet be permitted to him to complete his long-projected work on jurisprudence. Even then, the ardour of his mind would not suffer him altogether to relinquish a hope which, it was but too evident, could never be fulfilled. He died only a few days after the meeting to which we have referred, on the 17th July, 1790, bequeathing the valuable library which he had collected to his nephew, Mr. D. Douglas; appointing his friends, Dr. Hutton and Dr. Black, the executors of his will; and entrusting to them the charge of publishing the few unfinished sketches which had been allowed to survive him.

SECTION 7.—*On the general Character and Writings of Smith.*

THE character of Dr. Smith, like that of all men whose lives have been devoted to the pursuits of philosophy and science, may be best traced in his writings. It has perhaps been the fortune of few men so eminent to have engaged so little in the commerce and bustle of active life, and of few, it has been said, to have been so little fitted for it: yet the intellectual and moral capacities of this illustrious man were evidently of an order to have filled, and adorned, the highest station in society; and, notwithstanding the abstraction in which he lived, for the most part, from the business of the world, and some peculiar and characteristic traits which occasionally marked his habits and his opinions, it is clear that, with an understanding of the loftiest range, he was free, in many respects, from that exclusiveness and pedantry which have been sometimes ascribed to philosophers of great name, and which have given currency, we suppose, "to the opinion, so industriously propagated (says Mr. Hume) by the dunces in every age, that a man of genius is unfit for business." In the establishment of his most enlightened theories, and those least of all subject to be disputed in their ultimate and general tendency, he did not lose sight of that modification which they may occasionally require in practice, for the accomplishment of an immediate and beneficial purpose; and if the evidence of many striking passages in his works may be trusted, he did not incur as a philosopher, and would not have incurred as a statesman, the censure of rashly and unfeelingly adhering to an abstract principle in disdain of the interests which might be prejudiced, or even the prejudices which might have been shocked, by its application.

Nothing is more obvious, and nothing contributes so much to the beauty and value of his writing, as that in all his speculations he carried human life along with him; he never forgot that it was the chief praise and glory of philosophy to teach men how to act and to live; and he breathes through every page the admirable sentiment of a noble author—" That whatever study tends neither directly nor indirectly to make us better men and better citizens, is at best but a specious and ingenious sort of idleness, and the knowledge we acquire by it only a creditable kind of ignorance—nothing more[*]." This is eminently displayed in that valuable chapter to which we have referred, in the fifth book of the " Wealth of Nations," on the " Institutions for the Education of Youth"—one of the most profound and powerful disquisitions in any language. Neither the abstractions of philosophy, nor the pride of learning, nor the habits of the professor, could render him insensible to the purpose to which they ought all to be subservient, namely, the real interest of those who are to be taught. But the spirit of monopoly in such institutions he shews to be as inimical to those interests as it is in every other case. " The endowment of schools and colleges," he says, " have been opposed to this interest; they have not only corrupted the diligence of public teachers, but they have rendered it almost impossible to have any good private ones. Were there no endowed institutions for education, no system, no science could be taught for which there was not some demand. A private teacher could never find his account in teaching either an exploded and antiquated system of science acknowledged to be useful, or a science universally believed to be a mere useless and pedantic heap of sophistry and nonsense. Such systems, such sciences, can subsist no where but in those incorporated societies for education whose prosperity and revenue are, in great measure, independent of their reputation, and altogether independent of their industry. Were there no such institutions, a gentleman, after going through, with application and abilities, the most complete course of education which the circumstances of the times were supposed to afford, could not come into the world completely ignorant of everything which is the common subject of conversation among gentlemen and men of the world." —" The discipline of colleges and universities," says he, in another passage, " is in general contrived, not for the benefit of the students, but for the interest, or, more properly speaking, for the ease, of the masters. Its object is, in all cases, to maintain the authority of the master; and whether he neglects or performs his duty, to oblige the students, in all cases, to behave to him as if he performed it with the greatest diligence and ability. It seems to presume perfect wisdom and virtue in the one order, and the greatest weakness and folly in the other. Where the masters, however, really perform their duty, there are no examples, I believe, that the greater part of the students ever neglect theirs. Such is the generosity of the greater part of young men, that so far from being disposed to neglect or despise the instructions of their master, provided he shews some serious intention of being of use to them, they are generally inclined to pardon a great deal of incorrectness in the performance of his duty, and sometimes even to conceal from the public a good deal of gross negligence."

Such are the manly and liberal doctrines which he has put forth on this all-important topic. How unlike to the contracted and monkish sentiments entertained by many men, a great portion of whose lives has been passed within the walls of an university; and that too in the capacity of public teachers!

He was an ardent lover of freedom, but his devotions were not paid to her as to an unknown goddess, of whose attributes he was ignorant, and to whom his offerings were but an idle and a gaudy worship. If he loved freedom, he understood, better than the lovers of freedom have always done, in what it consisted: by what institutions it might be rendered most permanent, and its substantial blessings be more widely and equally diffused. The scorn of oppression and injustice was in him an active and discerning sentiment; and, in his ardour for the interests and happiness of mankind, he felt alike, whether the means by which they were inflicted were legal or illegal. The poor and the weak, the humble and the unprotected, he knew had, in every age, endured more of evil from the operation of unjust laws than they have ever done from the mere violation of law. It was their condition, that is, the condition of the great mass of society, which he studied and wrote to ameliorate; and his language never assumes a loftier or more ardent tone than when he advocates their interests, —the interests of mankind at large, against some crying wrong, sanctioned, as it may happen to be, by law or charter. We might refer in proof of this to his observations on the laws against the combination of workmen, where he vindicates the poor against the power of the rich—on the law of settlement, the law of entails, and the severe and contemptuous tone in which he censures the spirit of commercial monopoly under every form. Nor did he fail to visit with equal severity the sentiments in which such impolitic and unjust regulations have their origin. Witness the indignant manner in which he replies to the miserable complaints of those who, disposed to view every improvement in the condition of the labouring classes of society as an encroachment upon their superiors, censure every increasing comfort they enjoy as a luxury to which they have no right. As he reprobates the injustice and impolicy of any attempt to retard their advancement, if such were possible; so has he treated with still greater contempt the monstrous and cruel paradox which has been sometimes maintained, that a liberal rate of wages relaxes the industry of the labourer, and that he never works so well as when he is ill requited for his labour.

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[*] Lord Bolingbroke—On the Study of History,

" The liberal reward of labour," says Smith, " as it is the effect of increasing wealth, so it is the cause of increasing population. To complain of it is to lament over the necessary effect and cause of the greatest public prosperity. As it encourages the propagation, so it increases the industry, of the common people. The wages of labour are the encouragement of industry, which, like every other human quality, improves in proportion to the encouragement it receives. Where wages are high, accordingly, we shall always find the workmen more active, diligent, and expeditious. In cheap years, it is pretended they are generally more idle, and in dear ones more industrious than ordinary. A plentiful subsistence, therefore, it has been concluded, relaxes, and a scanty one quickens their industry. That a little more plenty than ordinary may render some men idle cannot be doubted; but that it should have this effect upon the greater part, or that men in general should work better when they are ill fed than when they are well fed, when they are disheartened than when they are in good spirits, when they are frequently sick than when they generally are in good health, seems not very probable." . . .

" Our merchants and master-manufacturers too (he says, in another part of his work) complain much of the bad effects of high wages in raising the price, and thereby lessening the sale of their goods both at home and abroad. They say nothing concerning the bad effects of high profits. They are silent with regard to the pernicious effects of their own gains. They complain only of those of other people."—*Wealth of Nations*, Book I. ch. 8—9.

Yet his zeal in the best of causes never made him lose sight of the end of all law—the preservation of the peace of society. He takes care to shew that it is not the province of a good or a wise man to seek the establishment of his principles by violence or undue pertinacity, and in disdain of the prejudices and institutions of the community which he seeks to influence.

" The man, whose public spirit is prompted altogether by humanity and benevolence (he says, in one of the finest passages of his writings) will respect the established powers and privileges even of individuals, and still more those of the great orders and societies into which the state is divided. Though he should consider some of them as in some measure abusive, he will content himself with moderating what he often cannot annihilate without great violence. When he cannot conquer the rooted prejudices of the people by reason and persuasion, he will not attempt to subdue them by force; but will religiously observe what by Cicero is justly called the divine maxim of Plato, never to use violence to his country, no more than to his parents. He will accommodate, as well as he can, his public arrangements to the confirmed habits and prejudices of the people, and will remedy, as well as he can, the inconveniences which may flow from the want of those regulations which the people are averse to submit to. When he cannot establish the right, he will not disdain to ameliorate the wrong; but, like Solon, when he cannot establish the best system of laws, he will endeavour to establish the best that the people can bear*."

Finely as he has tempered in his writings the rigour, if we may so speak, of his speculative doctrines; and careful as he is at all times, by the infusion of moral sympathy, to correct any error or evil that might lurk in the logical inferences to be deduced from them; with a sagacity in his general reasonings, alive to the nicest shades in the conduct of the understanding and the passions; his excellent biographer has given us reason to think that his unpremeditated opinions both of men and books were not always such as might have been looked for, from the soundness of his judgment, and the singular consistency of his principles as a philosopher. His discernment of the character of individuals was often defective, and apt, like his particular judgments on other occasions, to be influenced by accident and humour. He seemed to be habitually inattentive to familiar objects and common occurrences, and "has frequently exhibited instances of absence," says Mr. Stewart, "which have scarcely been surpassed by the fancy of La Bruyère."

Some striking and amusing instances of this infirmity have been recently made public, by a lively and agreeable writer, from whose powers of humorous description, however, it may well be supposed they have lost nothing in the narrative.† We will mention one circumstance which is recorded by Mr. Mackenzie, in illustration. When that gentleman wrote the beautiful story of La Roche, in the 'Mirror,' in which, with reference to the character of Mr. Hume, he embodied the sentiments which the good nature and benevolence of that illustrious man might have suggested under the circumstances imagined, he was particularly anxious that there should not be a single expression in it, which could give offence or uneasiness to any friend of Mr. Hume's; and he read the story to Dr. Smith, desiring him to say, if there was anything in it that he would wish to be omitted or altered. He listened to it very attentively from beginning to end, and declared that he did not find a syllable to object to, but added (with his characteristic absence of mind, says Mr. Mackenzie), *that he was surprised he had never heard the anecdote before.*

It may be easily supposed that with such a propensity to abstraction, he did not readily fall in with the tone of general conversation, and that in consequence of that, and of his professional habits as a lecturer, he was apt to express rather exclusively, the result of his own meditations, without sufficient reference at all times to the topic in hand, or the immediate purpose of its discussion; and that his style had more of the precision of a formal discourse, than of the ease and freedom which constitute the charm of colloquial intercourse. It is reported of him too that he was occasionally more positive in the assertion of his opinions than is always becoming in a philosopher, and that notwithstanding the extent and variety of his information, he erred sometimes from taking a partial and peculiar view of a subject, as it might chance to be connected at that particular moment with some passing speculation in his mind.

His learning was extensive and profound. His study had not been confined to the subjects which might appear to have occupied the whole labour of his life. The sciences of ethics and politics were not taken up by him, as detached and abstract branches of philosophy. They came presented to his mind as part of the greater science of human nature, to which he had always devoted himself; and in the contemplation of which he borrowed every aid which a careful observation of the various institutions which have existed among men, their history, their language, and the monuments of their arts and letters, could afford him. But he loved literature, as he loved virtue, for its own sake, for its intrinsic beauty and worth. In its best records, those which exhibit the actions, and display the passions and sentiments of men, whether in philosophy where they are traced to their causes; in history, in poetry, and oratory, where, under different forms, they are beheld in their operation; amid that exhaustless variety of circumstances and vicissitude of fortune, under which man has been seen at once an agent and a victim; he found the everlasting materials for his speculations, the real and only data of all moral science. He did not affect to despise, economist as he was, the imperishable productions of human wit and genius, the poetry of Homer or of Milton, the eloquence of Demosthenes, or of Fox; because he could find in their works no argument for the theory of rent, or the doctrine of population. Nor was he pleased to think it the part of a philosopher or a philanthropist, to sneer at the domestic affections, and the social virtues, in the most comprehensive investigations which he instituted, and which had for their object the common benefit of mankind.

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* Moral Sent. vol. ii. part vi. sect. 2.

† Vide Quart. Rev. On the Life of John Home, ascribed to Sir Walter Scott.

In his last hours he found delight in the tragedies of Euripides and Racine; and the drama, and the principles of the dramatic art, and of poetry in general, formed a frequent and favourite topic of his conversation. He was a great advocate for rhyme, a more unqualified one even than Dr. Johnson, for he was accustomed to contend for the propriety of it as well on the stage, as in all other departments of poetry[*].

As he loved to read it, he was accustomed to quote poetry, and the number of beautiful passages which he had treasured in his memory, and was in the habit of introducing in conversation, was remarkable in a man distinguished by so many higher acquisitions.

His peculiar taste is best exemplified in the style of his writings, which possess, even in that respect alone, merit of a very high order. If he has not (and who has?) the grace, the "careless, inimitable beauties,"[†] of Mr. Hume, it was owing in some measure to his not having mixed in such varied society; a circumstance which, acting upon the refined taste of the latter, lent to his compositions that inexpressible charm, which Gibbon may be supposed to have felt, when he describes himself in his ambition to emulate him, as "closing the volume with a mixed sensation of delight and despair[*]."

The great aim of Dr. Smith as a writer, and his great merit, is a marvellous perspicuity in the exposition of his ideas. Often diffuse, but never prolix; sometimes condensed, but never entangled in his expression; he unfolds the process of his reasonings so amply, that he leaves nothing to be supplied by his reader but a careful attention to his matter. Mr. Fox however is reported to have said of him, perhaps hastily, that he was unnecessarily diffuse, and fond of deductions where there was nothing to deduce. Mr. Stewart, with greater reserve, has ventured to hint a criticism nearly similar, and has ascribed this quality in his compositions to his early fondness for the study of the Greek geometry.

His greatest defect in the "Wealth of Nations," along with some faults in the arrangement of his subject, arises from his frequent digressions; his long dissertations upon some incidental questions, which frequently encumber the text, and intercept that complete and unbroken view of the subject as a whole, which a didactic author, who desires to interest and inform his reader, should always endeavour to preserve, from the first simple proposition with which he sets out, to the final developement of his system in all its parts. This defect arose partly from a peculiarity in his judgment, which led him to reject the use of marginal annotations; so useful in treating of many subjects, and certainly, it would seem, not the least so, in many which Dr. Smith undertook to discuss in his great work. It is curious, however, that, in the "Wealth of Nations," there are, we believe, but three or four notes, of four or five lines each, in the whole work, and these containing little more than references to authorities; whilst, in the "Theory of Moral Sentiments," there occurs but one of considerable length, and of importance more than equal to its length, in which it is remarkable that he has embodied a piece of reasoning, having essential reference to his system, of which it may be said, indeed, to furnish one of the strongest supports, and the clearest illustrations to be found, perhaps, in the whole work.*—†

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[*] It is well known that the two Doctors got to rather high words once at Mr. Dilly's table, where they met at dinner. Many years after this, when Johnson, on some occasion, was maintaining the superiority of rhyme over blank verse, Boswell observed that he had heard Adam Smith enforce the same criticism in his lectures at Glasgow. "Sir," said Johnson, "Smith and I once met, and we did not much take to each other; but if I had known *that the dog loved rhyme as much as you say he does, Sir, I should have hugged him.*"

[†] Gibbon's Memoirs.

[*] Gibbon's Memoirs.

There is no doubt that he bestowed great care upon the style and composition of his works. And after all his practice as a writer, he is said never to have acquired that facility which is often attained by it, but to have written as slowly, and with as much labour at last, as he had ever done. This however was the effect, in some measure, of the nature of his speculations, and the general character and conduct of his understanding. In all his works, though we find passages of exceeding eloquence, force, and beauty, he is most distinguished for being a deliberate reasoner, and a candid and cautious thinker. It was usual with him, when employed in composition, not to write with his own hand, but to walk about his room dictating to an amanuensis. He had collected, in the course of his life, a very valuable library, which he bequeathed to his cousin, Mr. David Douglas. As he was a lover of books, he was more attentive to their condition, and the outward fashion of them, than is usual with scholars in general. When Mr. Smellie once called upon him, and was admiring a splendid copy of some classic author, and the general elegance of his shelves,—"You see, Sir," said Smith, "if in nothing else, I am a beau at least in my books."

Besides the two great works of which we have spoken, and on which the fame of Dr. Smith will for ever rest, we must not omit to mention the very original and ingenious dissertation on the formation of languages, which was appended to the early editions of the "Moral Sentiments," and still continues to be published along with that work; and the few masterly, but unfinished sketches which were published shortly after his death. The tract on languages is a piece of extensive learning and profound observation; but though Mr. Stewart has bestowed high praise upon it, it seems hardly to have attracted the notice it deserves. The longest and most important of the posthumous essays, is entitled a "History of Astronomy," in which the author proposes to illustrate the principles which suggest and direct philosophical inquirers, by an account of the origin and progress of that interesting science. The same train of thought was pursued in two shorter and more imperfect essays, on the "History of the Ancient Physics," and that of the "Ancient Logic and Metaphysics." Along with these is a disquisition of very great beauty, entitled, with his accustomed amplitude of language, "On the Nature of that Imitation which takes place, in what are called the Imitative Arts;" and another, on the "External Senses"—all abounding in great originality of thought, exquisite illustration, and expression the most expanded and luminous.

In the "Sketches of the History of Philosophy," we find the same turn and tendency of mind which he has displayed in his greater works; a disposition which delighted to ascribe the first exercise of the imagination and the intellect, not to any view of profit or advantage in its results, but to a natural desire to fill up the void which was felt by the mind, from its inability to comprehend and connect together the various, and, as it would seem, the disjointed appearances which present themselves to its contemplation in the scenes and operations of nature. "Philosophy," says Dr. Smith, "is nothing but the science of the connecting principle of nature." It is an art addressed to the imagination, which seeks to adapt and reconcile to that faculty some theory, more or less satisfactory, of the phenomena, which, at first view, are void of order and connexion, and of meaning. The superiority of the Newtonian philosophy, he maintains, consists only in this,—that it is the most pleasing solution of the great problem of nature which has yet been given —that it connects more easily and more simply the appearances of the heavens in the fancy—not that it is by any means to be regarded as unfolding the actual chains which nature makes use of to bind together her several operations.

In the few observations which have been made upon the writings of this illustrious man, as in the short extracts introduced from them, it has been less our object, as will be seen, to dwell upon their merits with reference to any *system*, either of morals or economy, or to the soundness or fallacy of any particular doctrine, than to point out the admirable spirit which animates every part of that system; and those principles to which he always appeals, as the legitimate sources whence alone we can draw the materials of all moral and political institutes. To have done more than this, to have given even a very brief abstract of his system, in either of his two great works, would have far exceeded the limits of the present memoir; would require, and might well deserve, a separate treatise.

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* Dr. Smith was betrayed into this rejection of marginal writing, by his classic adherence to the plan of composition of the ancients, who were equally ignorant of the use and the abuse of our modern practice; but many of whose works would evidently have been much improved by a moderate adoption of it; and every reader of the "Wealth of Nations" must have felt how much he would have been relieved in the study of this great work, if many portions of it, which might be pointed out, had been removed from the text to the margin, to be consulted in their proper places, and not allowed to interrupt, as they often do, a chain of profound and subtle reasoning, or an interesting deduction of consequences of the highest importance to the establishment of the point in question.

† Vide "Theory of Moral Sent.," Part ii. Sect. 1.

What has been attempted, however imperfectly, may not be altogether without its use, at least until propositions in the moral, as in the mathematical sciences, shall admit of demonstration. When that shall be the case, and the results of our reasonings can be submitted to so decisive a test, the sources whence we derive them, and the mode in which they are conducted, may be alike indifferent, and cannot assuredly affect in the slightest degree the truths demonstrated. Till then, however, it must be considered as no unimportant part of that species of philosophy which, in the expressive language of Lord Bacon, comes home to men's business and bosoms, to temper its doctrines by moderation and modesty; to engage the sympathies on our side of those we undertake to teach, and not to repel them; to endeavour to shew, if we can, that the doctrines we inculcate may be traced to a higher wisdom than that of man, by being in conformity with the rules by which nature seems to work, and in furtherance of principles which she has evidently implanted for the accomplishment of her own great ends.

No philosopher has so constantly borne in mind as Dr. Smith, that in the moral, as in the physical constitution and frame of man, nature has made certain provisions for his attainment to virtue and to happiness, which the ignorant may overlook, and the arrogant may disregard, but with which the wise will only study to co-operate. And all the precepts we can put forth will derive their best sanction, and afford the strongest presumption in their favour by their being shewn to be in unison with those simple instincts of our nature, by which alone, as individuals, we are first taught to apprehend a distinction betwixt good and evil,* and which, in the obvious arrangements they suggest for the social union, were equally intended by our great Creator as lights to the economist and the legislator for the framing of those laws and institutions which take place in the wider and more complicated associations of men. It was in this excellent and truly enlightened spirit, that Smith, by applying the experimental method of reasoning to moral subjects, attained the vantage ground of that higher philosophy of which it is the glory of Bacon to have pointed out the road;—by which Newton ascended to the discovery of the sublimest truths in physics;—and by the careful cultivation of which alone, if ever, it may be hoped, that the moral and political sciences will be placed on a foundation equally enduring, and when knowledge in them will more surely become power to man, as their reference to his happiness and advancement is more obvious and immediate.

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* It has become usual of late, even in moral and political discourses, to regard all reference to authority as marks of a poor and illogical understanding. In the physical sciences, those more especially which rest upon mathematics, (as we have said in the text) the argument from authority is of course out of the question. It is different we conceive in other subjects;—and though we have little respect for an hypothesis, however supported, which appeals *from* the universal sense and feelings of mankind, an authority that appeals *to* that sense and those feelings is entitled to a good deal, and for our parts we should be satisfied to take our chance of error, in a question concerning the principle of moral approbation—for instance, with Hume and Smith, and Stewart and Mackintosh.

LIFE OF CARSTEN NIEBUHR.

Introduction.

The memoir which we are about to lay before our readers is the life of a man sprung from the ranks of the people, and retaining through life his sympathies with them. At the highest point of elevation to which he attained, favoured by his prince, respected and admired by the learned and eminent of all countries, it was his pride that he was born a peasant of Free Friesland. His manners never lost the simplicity, nor his morals the purity of that singular and estimable class of men. If ever there lived a man who might safely and reasonably be held up to the people as an object of imitation, it was Carsten Niebuhr.—Not only was he a poor man,—an orphan,—born in a remote part of a remote province, far from all those facilities for acquiring knowledge, which in this age and country are poured out before the feet of the people;—he was not even gifted in any extraordinary way by nature. He was in no sense of the word a *genius*. He had, as his eminent biographer remarks, no imagination;—his power of acquiring does not seem to have been extraordinarily rapid, nor his memory singularly retentive. In all cases where the force of that will, at once steady and ardent, which enabled him to master his favourite studies, was not brought to bear, his progress was slow and inconsiderable. It is not, therefore, in any supposed intellectual advantages that we must look for the causes of his rise to eminence. They are to be found rather in the moral qualities which distinguished him, qualities attainable in a greater or less degree by men of the humblest rank, of the most homely intellect, the least favoured by situation or connexion. It will well repay us to look a little more nearly into these qualities;—they are the bases of everything which a man of unperverted judgment and taste would respect in others or desire in himself.

He possessed in an eminent degree the distinguishing virtues of his country,—sincerity, unadulterated and faithful love of truth, and honesty. The zeal with which he gave himself to a pursuit which might enable him to be useful to his native district;—the total absence of vanity and of all interested motives which characterized the whole course of his studies and of his journeyings;—the simplicity of his narrative, in which no more of himself and his individual feelings appears than is just necessary to keep up the thread of the story;—the rigorous accuracy and anxiety after truth for which his travels have ever been, and still remain, pre-eminently distinguished among all who preceded, and all who have followed him on the same ground, afford ample evidence of the singleness and the steadiness of the motives which actuated him. The punctilious honour which distinguished his disbursement of the funds entrusted to his care by the Danish government;—the exactness with which he abstained from applying a farthing of this money to any object which could be considered by others, or which his own more fastidious delicacy could regard, as a personal gratification, (though connected as all his pleasures were with the interests of science and the scope of his mission, prove that honour is confined to no class, but that its highest refinements are within the reach of the humblest.

His self-command was perfect. He could abstain from what was agreeable, and do what was disagreeable to him. He was, of course, sober, temperate even to abstemiousness, laborious and persevering; neither discouraged nor elated by the incidents which he must have known were inseparable from the career he had chosen.

The more tranquil and uniform course of life which he led from the time of his marriage till his death,—his conduct as a father of a family and a citizen, are marked by the same integrity, active usefulness, and simplicity. It was not one of the smallest benefits he conferred upon his country and society that he imbued his illustrious son with the same fervent and steady zeal for truth and freedom, the same devotion to science, the same respect for all that is beneficent and honourable, which animated his own blameless and useful life. Happy the country which can draw such men as Niebuhr from the ranks of her peasantry to the highest walks of science, and the most important posts in her service!

LIFE OF NIEBUHR.

HADELN, as we are informed by the historical notice at the end of the ancient Frisian laws, printed at Wittewierum, was a province of Friesland, and formerly, under the name of Hadelre, belonged to the seventh *Seeland**, or maritime district. At the dissolution of the great Frisian federation, it lost its republican freedom, and, after experiencing various fortunes, fell into the hands of the Dukes of Saxelauenburg, and, together with that duchy, devolved to Hanover.

The country consists of marsh, with the exception of three parishes of moorland: the peasantry are, as usual in Friesland, universally free proprietors, every one of whom possesses, inhabits, and cultivates his farm, with the fullest and most perfect enjoyment of the rights of property. Down to the time of the French conquest the local administration was free, in the hands of magistrates chosen by the peasantry;—the taxes were extremely light, and the prosperity and comfort of the peasantry very great†.

In this country,—among these free men,—himself a free peasant, or yeoman,—was Carsten Niebuhr born. on the 17th of March, 1733, in his father's farm-house, in West Lüdingworth. His father and his ancestors, from his great great grandfather downwards, (higher than whom our accounts do not reach) lived as yeomen on their own marsh farm;—in competence, though not in affluence.

It is a remarkable fact that certain epochs produce men distinguished in the same art, or science, or talent, whilst other epochs are utterly barren of them. This was the case, in the north of Germany, with the contemporaries of Carsten Niebuhr. In or about the same year occurred the births of Count Andrew Peter Bernstorf, of Reimarus, Hensler the father, Behrens, and, at remoter distances of time and place, of many other celebrated men. The men of this time were distinguished for a remarkable activity, a singular earnestness and zeal, and a robust health of body and of mind; they have left behind them the most durable monuments in their works and in their actions. They came after Winkelmann, Kant, and Klopstock, by just such an interval as to be rising up to maturity when the latter had reached it.

Carsten Niebuhr lost his mother before he was six weeks old. He grew up under the care of a stepmother in his father's house, where his way of life and his employments, as well as his education, were those common to the peasant boys of his country. It was, probably, owing to his own eager desire for knowledge, that his father was induced, only with a view to his being somewhat better instructed than a common peasant, to send him to the Grammar-school in Otterndorf, whence he afterwards went to that at Altenbruch. But the removal of the schoolmaster of that place and the prejudices of his guardians (for his father had died in the interval) put an end to his school studies, before he had gone far enough even to have them sufficiently impressed on his memory, to be of any service to him, when he afterwards resumed them.

The division of his father's property between the surviving children had left him, instead of the farm which had been so long the hereditary possession of the family, only a very small capital, quite inadequate to the purchase of any land for himself; and necessity would have led him to acquire knowledge as a means of subsistence, even if he had been of a character to endure to live without education and without employment. He was obliged, however, to content himself with such accomplishments as were attainable without school learning; he, therefore, for a year, pursued music with great zeal, and learned to play on several instruments with a view to earn his living as an organist. As this employment, likewise, did not meet the approbation of his guardians, his maternal uncle took him home to his own house, where he passed about four years, during which his life was once more completely that of a peasant. The older he grew, however, the less could he endure the void and dulness of this way of life, which can only be relieved, either, as in old times, by a share in the general deliberations on the affairs of the community, and by cheerfulness and merriment, or, as is the case with the English farmer, by a participation in the advantages of education, and literary amusement. He felt an irresistible impulse to learn, to employ himself, and to render himself generally useful.

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* Friesland, divided into seven Seelanden, or provinces, was exposed to frequent landings of the Normen on their coasts, and on the landside to attacks from the neighbouring Bishops and Counts. To secure themselves from external assault and from internal disquiet, the seven Seelanden formed themselves into a closely united body. This union was ratified at Upstalsboom in the middle of the 11th century, at a general assembly of the people.—WIARDA.

† The peasantry of Friesland enjoy many remarkable rights and liberties rarely to be found in other countries. At one time the *Landstandschaft*, or right and dignity of legislative landed proprietors, was claimed by the freeholders or hereditary owners of small portions of land. These freeholders are chiefly to be found in the marshes, and the marshmen are principally distinguished from the moorlanders from the rareness of allodial tenures among them. The freeholders possess the entire property of their land, and are subject to no one but the government, to which alone they pay taxes and render the service attached to the land. Those freemen who possess not considerable farms, but a few acres, are called Cotters (Köther) and generally carry on some other accessary or subordinate business.—WIARDA.

The purely accidental circumstances which determine the course of life of distinguished men deserve to be remembered. In the highest degree accidental was that which gave to Niebuhr the direction which he thenceforward followed, until it led him to become the most eminent traveller of modern times. A lawsuit had arisen concerning the superficial contents of a farm, which could only be decided by measurement; and, as there was no landsurveyor in Hadeln, the parties were obliged to send for one to another place. Niebuhr felt for the honour of his native district with all the warmth of old times, and this occurrence appeared to him disgraceful to it: he could now fulfil a duty towards his country by learning the neglected art, which at the same time furnished him with an occupation and an object such as he desired. He was, in the meantime, come of age, and, as he learnt that instruction in practical geometry was to be had in Bremen, he immediately repaired thither. This plan was frustrated; the teacher upon whom he reckoned was dead; but he did not disdain the instructions of a humble practitioner of the art. He, however, would have been obliged to lodge and board in his house, and here the bashful, strictly decorous and self-distrusting young peasant, found two town-bred young ladies, sisters of his intended teacher, whose attentions appeared to him so singular that he quickly took his departure. He now turned his eyes toward Hamburgh, but there he was destined again to experience disappointment, and to have his perseverance put to the test.

He had passed his two-and-twentieth year when he went to Hamburgh to avail himself of Succow's instructions in mathematics, and, without any false shame on account of his age, tc begin his school studies anew. His income was not sufficient to maintain him even with that rigid frugality which was natural to him. He determined, however, to spend just so much of his small capital as would enable him to accomplish his end. He arrived at Hamburgh in the summer of the year, 1755, as we find from his letters to president Beymgraben, the only friend of riper age and judgment he then possessed, by whose family they are reverentially preserved.

But just at this time Succow was called to Jena: the mathematical chair was empty, and was not filled until Büsch was appointed to it. The severest application to private instruction was, therefore, necessary to make the lessons at the gymnasium (or public school) intelligible or profitable to him. A countryman of his, named Witke, who, at that time, lived in Hamburgh as candidate for holy orders, and who afterwards died at Otterndorf, where he was pastor, gave him this private instruction with true cordiality and friendship. Niebuhr always spoke of him as the person who laid the foundation of his education, and, as such, honoured and loved him with grateful piety. Notwithstanding his uncommon exertions, and the strength both of his body and mind, twenty months, eight of which passed in merely preparatory studies, (for the Latin tongue was almost entirely unknown to him,) were quite insufficient for one who began to learn so late in life; to acquire that quantity of learning which more fortunate youths bring with them to the university. Among other things thus unavoidably neglected was Greek, which he alway, greatly lamented the want of.

Under Büsch he had begun to learn mathematics: he was the earliest and the most distinguished of all his pupils, and in after-life became his most intimate friend.

To stop half-way in any undertaking was thoroughly repugnant to his whole character. He had gone to Hamburgh solely with a view to acquire a knowledge of geometry, and of some things commonly taught in schools; but as soon as he had become acquainted with the sciences, he could not rest until he was able to embrace them in all their extent and depth, and in the Easter of 1757 he repaired to Göttingen. His pursuit continued to be mathematics: he was more than ever compelled, by the diminution of his little substance, to aim at some employment by which he could maintain himself, and to which his studies would lead. This he now looked to in the Hanoverian engineer corps, in which (as was the case in almost all the military services of Germany) men of efficient mathematical attainments were extremely rare, and might hope to become the makers of their fortunes by merit.

He studied with the steadiness which a fixed, simple, and prudent plan of life ensures, from the Easter of 1757 (when he came to the university,) for more than a year, undisturbed by the war which frequently raged around Göttingen[*].

At this time he recollected that an endowment, or fund for exhibitions, existed at this university, and begged his friend to ascertain whether it was only for poor students, in the strict sense of the word; or whether it was endowed without that limitation, "as a means of persevering in the study of something useful and important. In this case alone could he allow himself to apply for it." He received it, and reserved it entirely for the purchase of instruments.

At this period Frederic the Fifth reigned in Denmark in enviable tranquillity. Louis the Fourteenth's memory still shone throughout Europe with all that false glitter which had hung around his name during his life, and he was well known to be the model after which the ministers of the Danish monarch endeavoured, as far as it was compatible with the character of a peaceful king, to form their sovereign. Seldom, however, have the aims of a minister been less liable to reproach than those of the then Baron J. H. E. Bernstorf; and among all the statesmen of the continent, there was not, perhaps, one of his time so well informed, so intelligent, and so noble-minded. The truth of the charge brought against him, that the then system of administration was not suited to Denmark, was felt by some of his contemporaries, but this feeling was mixed up with personality and exaggeration. It cannot be denied, that for a century the nation had been declining: this was clearly attributable to two causes, namely, a rage for whatever was foreign, and an internal suffocation of the public mind, perfectly analogous to that with which the Jesuit opposers of the Reformation had accomplished the entire demoralization of Bohemia; and it was obvious that the population, both of the country and of towns, must, by political means adapted to their peculiar situations, be assisted in remedying this evil as much as possible. The extraordinary and beneficent qualities and endowments of the second Count Bernstorf will be remembered by a grateful nation, after a period of disaster, not merely with regret, since what he effected remains indestructible, and forms the sole basis for future reforms and improvements; but as having bequeathed an everlasting model in his administration. Posterity will perhaps mention, as among his uncle's noblest actions, the emancipation of his serfs, or slaves of the soil; the leisure which he ensured to Klopstock, and the scientific expedition he sent into Arabia. This enterprise was originally owing to Michaelis, who had represented to the minister of state that many elucidations of the Old Testament might be obtained by personal observation and inquiry in Arabia, which might be regarded as hitherto untrodden by European feet. The original idea in the mind of its author extended no farther than this; that a single traveller—an oriental scholar out of his own school,—should be sent by way of India to Yemen; a plan which would then have caused the undertaking to end in nothing, even supposing the traveller ever to have found his way back. Fortunately the minister immediately perceived the defectiveness of the scheme, and replied to it by a proposal to render the mission far more extensive in its objects and outfit. Thus it happened that the original and peculiar aim, at least in so far as concerned the questions which the originator of the plan suggested, dwindled into an infinitely subordinate object; whilst what was accomplished by those two men to whom jointly, and to whom alone, the fame of the expedition is due, grew into an importance, which had been neither foreseen nor aimed at by Michaelis.

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[*] "The studies of Göttingen," says Mr. Niebuhr, "were indeed but little disturbed by this cause. On the one hand, the French were extremely courteous and insinuating in their behaviour to the distinguished men of letters: (though had Richelieu's plan of devastation been carried through, this city would have been burnt to the ground.) On the other, the learned of that place were so utterly devoid of all the spirit of a patriot or a citizen, that one of them boasted that he had not abused the confidence of a French officer, who had blabbed to him the expedition against Brunswick, in 1762; and even that he had refused one of his pupils the use of his horse, which he begged for, that he might carry to the Hanoverian army intelligence which would have enabled it to surprise the enemy;—it was against his conscience! My father was otherwise-minded, and ventured into the French camp on purpose to gain intelligence. That such an extinction of all manly feeling in men of letters is fatal to science and literature, may be sufficiently seen in the works of these denationalized men.

"A far different spirit reigned at Halle, where, so long as the thunder of the cannon re-echoed from Rosbach, the master of the orphan school, and all his boys remained on their knees praying to God for victory for Frederic and Prussia, as if they had been in a besieged town."

The first project was submitted to Baron von Bernstorf, as early as the year 1756. As he took it up with all the vivacity and liberality for which he was so remarkable, and fully empowered Michaelis to propose an oriental scholar to him, it might have been expected that Michaelis would have proposed the man who, among all his contemporaries, was unrivalled for his knowledge of the Arabic language, and, as all Germany knew, was fighting inch by inch with starvation,—Reiske,—whom, moreover, Michaelis had known from the time he was at school. Instead of him, he recommended a pupil of his own, named Von Haven, whose acquirements must, at that time, have been those of a mere school boy, since a two years' residence at Rome, (whither he went to prepare himself under the Maronites,) and even the journey itself, never raised them above the meanest mediocrity.

Michaelis was also commissioned by Baron von Bernstorf to propose the mathematicians and natural historians, by the fortunate association of whom with the mission that minister gave it value and importance. For the choice of these men he applied to Kästner, one of the Göttingen Society of Sciences, of which he was then director. A student of Hanover, named Bölzing, at first accepted the proposal; but after a short time took fright, and withdrew his promise. Without doubt, Kästner would have chosen Niebuhr in the first instance, if the latter had studied long enough at the university to have shewn to what a high degree of aptitude he was likely to attain. As yet, little more could be known of him than his application and his excellent character. Fortunately, to that extent, Kästner already knew his pupil; and one day in the summer of 1758, on his way from a meeting of the society, to which he had just proposed Niebuhr, he walked into his room. "Have you a mind to go to Arabia?" said he. "Why not? if any body will pay my expenses," answered Niebuhr, whom nothing bound to home, and whom an unbounded eagerness after knowledge urged abroad. "The King of Denmark," replied Kästner, "will pay your expenses." He then explained the project and its origin. Niebuhr's resolution was taken in a moment, so far as his own inclination was concerned. But as he thought very humbly of himself, and most reverentially of science and of the truly instructed, he despaired of his own ability and power of being useful. On this head, however, Kästner set him at ease by the promise of a long term for preparation, which he might employ chiefly under Mayer in astronomy, and by the assurance that, with his determined perseverance and industry, the allotted time would be fully sufficient. The same evening Niebuhr, who wanted nothing to fix his resolution but Mayer's promise to instruct him in astronomy, went to him. Mayer, who was not so sanguine a man as Kästner, cautioned him against a determination which, with his character, would be irrevocable; while he knew not the dangers and fatigues he was about to brave: he, however, promised the desired instruction.

Michaelis, whom he visited the following day, probably saw levity and precipitation in so prompt a resolution, and pressed upon him a delay of a week to reconsider the matter. It passed, but Niebuhr did not trouble himself with any further deliberation on a subject upon which his mind was already thoroughly resolved, and Michaelis now regarded the engagement as definitively accepted. His conditions were, a year and a half, till the Easter of 1760, for preparation; and, during this period, the same salary as Von Haven received. These were assented to by Baron von Bernstorf without the slightest hesitation. He now lived solely for his object. He pursued his studies in pure mathematics, perfected himself in drawing, and sought to acquire such historical information as was attainable with that degree of learning which he had so lately and so imperfectly acquired, without neglecting his more immediate objects. He cultivated practical mechanics with a view to acquiring greater dexterity in handling his instruments, and in various manual operations, the acquirement and practice of which in Europe, except for those whose business they are, is but a waste of time. His attention was, however, principally occupied by the private lessons of Michaelis in the Arabic language, and of Mayer in astronomy. These he remembered with very different feelings. For the grammatical study of languages in general he had but little talent or inclination; but his lessons in Arabic were rendered peculiarly distasteful to him by the fact that, at the end of several months, his teacher had not brought him farther than the first fables of Lokmann, and he soon found out that Michaelis possessed no very great store of Arabic philology or learning. He therefore gave up this course of instruction, which Michaelis never forgave him.

Tobias Mayer was undoubtedly one of the first astronomers and mathematicians of his time[*]. Mayer's zeal for teaching his pupil was as great as Niebuhr's for learning of him. Among all the men with whom he became acquainted in the course of his long life, there was none whom he so loved and honoured as Mayer; and the most intimate friendship subsisted between them. He retained an ardent attachment to Mayer's memory up to the most advanced age, and fate never procured him any pleasure so great, as that of hearing that his first lunar observations reached his beloved teacher on his death-bed, before consciousness had left him, and had cheered and animated his last moments; and that these observations had decided the giving the English premium offered for the discovery of the longitude, to the widow of the man to whom he felt that he was indebted for his acquirements in this branch of science. Mayer on his part had no more earnest solicitude than to educate a pupil who would apply his method of determining the longitude, and his, at that time, unprinted lunar tables, of which Niebuhr made a copy.

He probably saw that blind, mechanical attachment to old ways and prejudices would for many years retard the reception of his method, but that, when proved by practical application, it would be impossible to stifle it. Mayer interested himself in the outfit for Niebuhr's journey, so entirely as if it had been his own personal affair, that he divided his quadrants with his own hands. The accuracy of this labour of friendship was proved by the observations which were made with it.

The time appointed for preparation had been prolonged by half a year; and it was not till the Michaelmas of 1760 that he left Göttingen. At Copenhagen he was most kindly received by the minister von Bernstorf, and gained his confidence to a greater degree than the other members of the expedition, who were already assembled there before him. As he received a pension from the king during the time of his preparation, he thought himself bound to purchase all his instruments at his own cost. He esteemed himself most happy to procure them in this manner. Bernstorf, to whose knowledge this accidentally came, pressed upon him compensation for what he had thus expended, and committed the travelling chest to him as a proof of respect for his rigid integrity.

He was at this time appointed lieutenant of engineers, a circumstance which only deserves notice for the sake of a letter which places his modesty and judgment in the most amiable light. "He was," as he wrote to a friend, "led to think of a title for himself by Von Haven's appointment to a professorship of the university of Copenhagen. A similar one had been offered to him, but he held himself unworthy of it. The one he had received appeared to him more suitable. He might have had that of captain if he had asked for it; but that, for a young man, would have been too much. As lieutenant, it would be highly creditable to him to make valuable observations; but, as professor, he should feel it disgraceful not to have sufficiently explored the depths of mathematical science." He had at that time no other plan than that of living in his native country, after the accomplishment of his mission, on the pension which was assigned to him.

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[*] The results of his labours were published after his death. They consisted principally of a catalogue of 992 stars, and his famous lunar and solar tables. His valuable theory of the moon, and the laborious calculation of these tables, together with the invention of Hadley's quadrant, in 1731, enabled Maskelyne to bring into general use the method of discovering the longitude by observing the distance of the moon from the sun and certain fixed stars, called the lunar method. Mayer died at the early age of thirty-nine, worn out and exhausted by his incessant exertions in the cause of science.

As more than half a century has elapsed since the death of his travelling companions, there can be no impropriety in recording what he thought and related of them.

Von Haven's uselessness as a linguist has already been mentioned. He had moreover chosen a career, for which, on all accounts, no man was less fitted. His sole thought was to return home; his favourite topic was the comfortable life which he there promised himself: no ardour for discovery or for observation made him forget the fatigues and privations of the journey, and no one had so many wants, and felt so many privations, as he. A dainty table and good wine were, in his estimation, the greatest blessings of life; and in Arabia, where the travellers found only scanty fare and bad water to appease their hunger and thirst, his discontent arose to a despair which often diverted, but sometimes disgusted his companions. He was by nature indolent, and thought himself fully excused from working under such a climate. He likewise frequently shewed himself haughty and conceited towards Forskaal and Niebuhr; he behaved as if he thought himself the highest and most distinguished of the party; and was greatly offended that Niebuhr had the care of the chest. After his death nothing of the slightest utility was found in his meagre journal.

According to Niebuhr's judgment and testimony, Forskaal was by far the most instructed of the party, and had he returned, would have attained to the highest rank among the contemporary men of science, by his manifold and profound acquirements. He had originally studied theology; his eager and free spirit had led him from Sweden to Germany; for a long time he had devoted himself to speculative metaphysics with great ardour; he likewise pursued the study of eastern languages, and at the same time as much of physics and chemistry, as well as of every branch of natural science, as was then known. The metaphysics of a mind of this stamp must have been very different from the scholastic pedantry of the time: the academical works in which he published his speculations on these subjects passed at Gottingen for odd—in Sweden, for rather bold and flippant; it is matter of regret that we do not know them. He willingly quitted his country, where, after his return from the university, he met with hostility on every side.

He stood in need of no preparation; the proposal for the journey found him perfectly prepared, and that to a degree in which few ever become so. In laborious industry, contempt of dangers, difficulties, and privations, he resembled Niebuhr. Both felt themselves called upon to observe whatever came before them. Forskaal's learned education, however, gave him a great advantage. He acquired languages much more rapidly and perfectly, and was soon able to read Arabic works with fluency. His faults were disputatiousness, caprice, and an irascible temper. Mutual respect and equal zeal produced a stable friendship between Niebuhr and him; but the harmony between them was not without some interruptions, until Forskaal on one occasion discovered that his companion's patience was not completely inexhaustable and impassive. Forskaal's papers have been carefully used by his friend, and what they contained of a narrative kind, or illustrative of the manners of the people, is inserted in Niebuhr's works with the author's name. Of the edition of his works on natural history we shall shortly have occasion to speak. It is painful to see how they have been neglected. Besides the systematical descriptions of new plants and their uses, they are rich in admirable observations on vegetable physiology, and in remarks on the husbandry and geological structure of the countries he traversed, particularly of Egypt, of which no such description previously existed. The late Vahl preserved and restored Forskaal's neglected herbarium, so far as it was still possible, and laboured to do justice to his memory. Linnæus manifested an odious spirit of hostility to his old pupil. Forskaal had told Niebuhr that he wished one of the species of plants he discovered (the one called Mimosella, in his Flora) to be named after himself. Niebuhr transmitted this wish of a man who had deserved immortality by his labours, to Linnæus; but instead of paying any attention to it he gave Forskaal's name to another species, also discovered by him, but which conveyed, by its appellation, the most obvious and malicious allusion to the departed. Niebuhr could never forgive this spiteful trick. Forskaal had also called one species of plants after him, in remembrance, perhaps, of the cordiality with which Niebuhr had assisted in all his excursions and collections. This, however, as he was no botanist, appeared to him inappropriate, and the sole alteration he permitted himself to make in Forskaal's papers, was to erase every trace of the honour intended him.

Of the physician, Dr. Cramer, nothing is to be said, except that the choice of him was most unfortunate; that he was incompetent, even in a professional point of view, but still more so for all the purposes of the expedition. It is to be lamented that Michaelis's wish to engage Hensler the father for the situation was fruitless. The draughtsman, Bauernfeind, was not a bad artist, but an uneducated and extremely narrow-minded man: love of drinking shortened his life.

The journey began under the most unfavourable auspices. The party went on board the Greenland ship of war which was bound to the Mediterranean to protect vessels sailing under Danish colours from English search. The Greenland left the Sound on the 7th January, 1761. Three times she was driven back to the Elsineur roads; nor was it till the 10th of March, the fourth time of her sailing, that she could continue her course to the Mediterranean.

Niebuhr recollected this voyage with pleasure. The noble and beautiful interior of a ship of war, with all its appointments and regulations, the simple and energetic manliness of the sailors, from the commander to the lowest man on board, a class of men whose distinguishing virtues were very much allied to his own, interested and delighted him in the highest degree. Nor did he find the way of life monotonous or dull. Navigation was, at that time, very imperfectly understood: its operations were conducted in a manner rather mechanical than scientific. The officers of a ship going on such a service were, however, doubtless, men distinguished in their profession. Niebuhr endeavoured to make himself acquainted with the construction of the ship; and he exercised himself daily in nautical and astronomical observations which procured him the satisfaction of being regarded by the officers as an active and useful member of their company. He thus obtained from them that respect and regard which practical men are always ready to bestow on those whom they find to be superior to themselves on any particular subject connected with their own business, and whom they see willing to acknowledge their superiority in other points, and able to appreciate their merits and services*.

Mayer, in the instructions he gave Niebuhr, had constantly kept in view that his pupil would be placed in situations in which it would be absolutely necessary for him to be able to rely upon himself, and where he could not hope for the slightest assistance or support. He had taught him entirely himself, and encouraged him with the assurance that an active and clear-sighted man is generally able to discover means of overcoming the obstacles which may oppose him. His method of teaching, which was entirely practical, was chiefly this. He first described to his pupil the object of the observation and the method of using the instruments: he then left him without any assistance, to try how far he could proceed in his observation and calculation, and desired him to tell him when he came to any insurmountable difficulty. He was obliged to describe exactly how far he had gone on well, and where his progress had been stopped; and then Mayer helped him out. He had been able to exercise himself but little in Göttingen in calculating lunar distances, and was in great anxiety about his future success in that point. The result of his observations during this voyage gave him greater confidence, and ought to have convinced him that he had gone through his apprenticeship, but this his modesty and humility forbade.

A stay of some weeks at Marseilles, and of a shorter time at Malta, procured a very agreeable recreation to the party. The scientific enterprise was known throughout Europe, and we should find it difficult, now, to picture to ourselves the universal interest in its success which ensured to the travellers the most cordial reception and the most respectful attentions. It was an enterprise consonant with the spirit of the times, and nowise solitary or strange. The King of Sardinia had sent the unfortunate Donati to the East: Asia was become an object of interest to Europeans from the war which the two great maritime powers were then waging in India: England began to send out ships to circumnavigate the globe. It was just that period of general satisfaction and delight in science and literature, in which mankind believed they had found the road that must inevitably lead to perfection: men of letters enjoyed great consideration; and everybody was ashamed not to regard the interests of science and of its followers as the most important interests of the human race.

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* It is a remarkable fact that in this same year, 1761, our great astronomer Maskelyne was also at sea, and engaged also in instructing the officers of the ship in which he sailed in the lunar method, with a view to its general adoption by our navy, which subsequently took place.

In both places, they experienced the courtesy and charm of French reception; for, even in Malta, although the ruling body were of all nations, the prevalent manners were French.

The attentions paid in that island were more particularly directed towards Niebuhr; and in the false hope that his religious scruples might be got over, if, at the conclusion of his undertaking, he would become one of their body, the knights of the order offered him all the honours, distinctions, and advantages which they could confer upon him, without an open violation of their statutes.

From Malta the expedition proceeded to the Dardanelles, still on board the Greenland, which had taken its convoy to Smyrna. In the Archipelago, Niebuhr was attacked with dysentery, and was near dying. He recovered his health at Constantinople, but so slowly, that at the expiration of two months after the beginning of his illness he had scarcely made sufficient progress to go on board a Dulcignote vessel bound for Alexandria, without manifest danger. Here, for the first time, the travellers felt that they were really in the East. The plague broke out among the crowded Asiatic passengers: they, however, were exempt from it.

As we cannot follow him through his minute and accurate descriptions of the places through which he passed, we must content ourselves with a few extracts from his travels, calculated to throw light upon his character; to show that clear and dispassionate judgment, and that freedom from prejudice, which so admirably fitted him for a traveller among people whose opinions and manners are so entirely unlike our own. Passing over his description of Constantinople, we give in his own words his account of the first oriental people with whom he was thrown into close contact:—

"The captain," says he, "his clerk and his steersman, spoke pretty good Italian. The clerk had been not only in Venice and other Italian ports, but had travelled as far as Vienna. The Catholics had told him just as great calumnies of the other sects of Christians as the Sunnites relate of all Mohammedans but themselves. I once asked him, whether any heathens were to be found in the Sultan's dominions? In the course of his reply, he said, 'There are many in Germany and Italy; they are called Lutherans, and know nothing of God or the prophets.' In religious disputation, he shewed himself a true Mohammedan. One of our company endeavoured to convince him of the truth of the Christian religion. The clerk immediately rose and said, 'that people who believed in other gods beside the one true God, were oxen and asses,' and left the room. The good man thus gave us a hint, that we should do well to leave every body undisturbed in the belief that his own religion is the best, so long as he entertains no doubts about it himself. I did not hold it to be any part of my vocation to make proselytes. But when I afterwards inquired of enlightened Mohammedans, concerning the principles of their faith, I took the opportunity of explaining to them various matters relating to the Christian religion; and as I carefully abstained from asserting that it was *better* than the doctrines set forth in the Koran, none of them were in the least offended or displeased."

In Egypt the party remained a whole year, from the end of September 1761, till the beginning of October 1762, during which time Niebuhr visited Mount Sinai, in company with Forskaal and Von Haven. The party did not go farther inland than Kahira. During their stay in Egypt, Niebuhr determined the longitude of Alexandria, Kahira, Raschid, and Damietta, by means of numerous lunar observations, with an accuracy which the astronomers of Buonaparte's expedition, to their great surprise, found fully equal to that of their own. They, and the French army, not only found his chart of the two branches of the Nile equally correct, but even his ground-plan of Kahira, taken under the most difficult circumstances, in the midst of an infuriated and fanatical populace.

"In the year 1801," says his illustrious biographer, "I laid this plan before a French officer who had risen from the ranks during the French revolution,—a man who could hardly write and was wholly unaccustomed to make use of ground-plans, with a view to gain some information concerning the entrenchments thrown up by the French army round the city, and the history of the great rebellion in Kahira. It was some minutes before he could translate the knowledge he had gained from personal observation into the symbolic language of drawing; but as soon as he caught the idea, he found his way, step by step, and could not cease wondering. My father, also, measured the height of the pyramids, and copied many hieroglyphic inscriptions on obelisks and sarcophagi."

At the time Niebuhr visited Egypt, very little information, worthy of credit, concerning that remarkable country, existed. Later travellers have added much to what he obtained; but when we consider under what circumstances of difficulty, and with how little protection, he added such vast stores to the stock of knowledge, we shall acknowledge that none have surpassed, or perhaps equalled him in industry, courage and devotion to his object. Of the obstacles he had to encounter, some idea may be formed from the following extracts.

At Alexandria, he says, "As I could overlook a great part of the old city walls, from the eminence on which Pompey's pillar stands, I took some angles of it from thence, and hoped that I might be able to take others from some other spot. One of the Turkish merchants, who stood opposite to me, and remarked that I had pointed the telescope attached to my quadrant against the city, was very curious to look through the glass, and not a little uneasy when he saw a tower upside down. This gave occasion to a rumour that I was come to Alexandria to turn the whole city topsy turvy. This report reached the governor's house. My janissary refused to accompany me when I took my instrument, and as I thought a European could not venture to appear in a Turkish city without a janissary, I gave up all idea of taking any more geometrical measurements here. Once afterwards, when an Arab of Raschid saw a ship upside down in my telescope, he was very near throwing the instrument on the ground. I learned by degrees to be very careful of the Mohammedans and their suspicions when taking my observations, which was the more necessary so long as I was unable to converse with them. . . . 'At an astronomical observation on the southern point of the Delta, a peasant was present, and behaved very courteously. As I wished to show him something he had never seen before, I placed the telescope of the quadrant opposite to his village, on which he was extremely terrified at seeing all the houses upside down. He asked my servant what could be the cause of this. He replied, that the government was extremely dissatisfied with the inhabitants of that village, and had sent me to overthrow it entirely. The poor peasant was greatly afflicted, and entreated me to wait long enough for him to take his wife, his children and his cow, to some place of safety. My servant assured him he had two hours good. He immediately ran home, and as soon as the sun had passed the meridian, I took my quadrant on board again. 'We must not wonder that Mohammedans were suspicious at the sight of these observations, since Europeans enough might have been found but a short time before, ready to believe every thing enchantment, which they did not understand."

He suggests the expediency of digging round the obelisk at Heliopolis, which, however, he had not the means to attempt. "The common Egyptians," says he, "are very unwilling that the Europeans should dig in the places where antiquities are found, from the idea that we are seeking for treasure. Perhaps, however, they would not forbid it, if the true motive of such researches were explained to the governor of the district, and the work done by his labourers. The peasants of Matare observed me very narrowly while I was measuring the height of the obelisk. They placed themselves at some distance, in consequence of their belief that I should throw up these huge stones into the air by some secret art, and take away the treasures concealed under them. This they were firmly resolved not to allow. They, however, did not speak an uncivil word to me, when they saw that their expectations were not fulfilled."

The following are the circumstances under which the plan of Kahira was taken, to which his son alludes in the passage just quoted—

"With a view," says he, "of giving an accurate description of the size and situation of this city, I have given a plan of Kahira and the adjacent towns Bulak, Masr el Atik, and Djize. This was really so troublesome, and, from the noted insolence of the Kahirians to all people of different religions, so dangerous a task, that no European had hitherto been found to undertake it, or will probably speedily undertake it again. I did, however, venture to measure all the streets, all at least which were thoroughfares, by paces, and to determine their bearings by a little compass. There are many parts, consisting entirely of little streets, which have no egress and can be entered only from the main street into which they all run. These are inhabited by labouring men and artisans, who, in the Eastern cities, do not work in their houses, but in little stalls or sheds in the Sûk or market place. As you cannot be supposed to be seeking any man in his dwelling-house, and as it is not the custom in the East to pay your respects to his wife or daughters, the people immediately conclude, if they see a stranger in any of these streets, that he has lost his way, and the first man who meets him, tells him that the street has no outlet at that end, and that he must turn back. It is, therefore, almost impossible for a stranger to obtain any knowledge of these quarters of the town."

One of the most remarkable objects in this city, is the palace of Joseph. "Here," says he, "is manufactured the magnificent cloth which is yearly sent as an offering to Mecca by the Sultan. The building still retains traces of its former splendour. In the room in which the weavers sit, the walls are covered with trees, houses, &c., in the most beautiful mosaic of mother-of-pearl, small stones of every variety, and coloured glass. On the walls of another room in which the cloth is embroidered, are some inscriptions in very good preservation. In a third the ceiling is very beautifully painted. Above, on the side of the Kara Meidân, where this great building is supported by a very high wall, springing from a steep rock, is a point commanding a magnificent view of the town, the surrounding country, and the pyramids. Some of the names of former regents of Egypt are engraved here. It appears that it was the residence of the Egyptian Caliphs and Sultans, and I could not help wondering that the Turkish governors do not inhabit it. I asked the overseer of the weavers, who not only conducted me about the building, but took me to his house and entertained me with coffee, after what Joseph this palace and a fountain in the city were named? He was of opinion that the palace was not more than 600 years old, and was built by Salaheddin, whose original name was Jusof."

Niebuhr's account of one of the most interesting phenomena in the world, the overflow of the Nile, is so curious, that we may be allowed to interrupt the course of our narrative a little longer, to insert it.

"When the Nile begins to rise, all the small canals which are led off from the main stream to water the adjacent fields, are stopped up and cleaned, and remain in that state until the water reaches a certain height. This height is ascertained by a Nilometer, on the island Rodda. For this purpose, a Sheikh is stationed there, who, as soon as he perceives that the water has risen at all, gives information of it. A number of poor people, who are already in waiting at Masr el Atîk, or Fostat, immediately hasten to Kahira, and each spreads the welcome intelligence through the streets of his own quarter. From this time, these people come daily at a certain hour to Fostat, and the Sheikh calls out to them from the islands, how many inches the Nile has risen.

"This is daily made public, until the Nile has reached the height at which it is appointed that the canal which runs through Kahira should be opened, at which time the tribute to the Sultan must be paid, and all anxiety about a scarcity is at an end. The information, however, thus proclaimed, is very little to be trusted. The Sheikh goes alone to the Nilometer, and always, at first, declares the height less than it really is; so that if, at a later period, the water should increase but little for some days, he may then be able to declare the rise greater than it is, in order not to alarm the inhabitants with the fear that the Nile should not reach the desired height. About the time when it was hoped the canal through Kahira would be opened, I sometimes went myself towards the mouth of the canal, to observe the height of the water against a high wall, and I discovered that the rise which was proclaimed in the city was three times as great as I had found it to be. In the year when I was in Egypt, it was first proclaimed that the Nile had begun to rise on the 29th of June, and, on the 8th of August, that it had reached the height of sixteen Drâ or ells. Hereupon, the dam of the canal of Kahira was cut through with the customary ceremonies, which have often been described. We expected the water in the city, but in vain; for the canal had been so imperfectly cleaned that year, that it was not till the 10th that we saw a little water, whereas we ought to have been able to navigate the canal the first day. This extraordinary event caused a great agitation among the people. It was openly said, that the person who had undertaken to clean the canal would lose his head. He, however, paid a large sum to the government, and was compelled to make a new dam at his own expense, which was thrown across the canal on the 11th of August, and opened, without any ceremony, on the 12th.

"Gabriel Zionita, in his appendix to the description of Africa by the Sherif Edrîsi, mentions, as very extraordinary, that the Egyptians have certain tests, by which they can ascertain beforehand how high the Nile will rise, and whether they may expect a plentiful or a scarce season. This, indeed, they think so easy a matter, that almost every Egyptian woman, whether Christian or Mohammedan, imagines herself competent to it. It is the universal opinion in Egypt, that the Nile begins to rise in Habbesh, (commonly called Abyssinia,) on the night of the 17th of June; or, as they express it, that the drop (Nokka) which causes the rise of the Nile, falls. On that night, therefore, the women put a certain quantity of dough on the roofs of their houses, and if this has not increased in weight by the morning, *the drop* has not fallen. But, if the dough is heavier, it has fallen, and they then proceed to calculate with great certainty how many feet the Nile will rise, and what will be the price of corn for the year. As the weather is very regular and uniform in Egypt, it is possible that there is a heavier dew at this season of the year; and as the women never put out their dough except just on the night above-mentioned, they are always confirmed in their faith in the certainty of their test. As some of the Kahirians reckon time according to the Koptish calendar, the women were not all agreed on which night *the drop* fell. Other experiments of the same kind are yearly made, but intelligent Mohammedans regard the whole thing as mere pastime for the women."

The arrogant intolerance of the Mohammedans, which keeps pace with their ignorance and superstition, he describes as follows:—"The Jews, the eastern Christians, and even the Europeans, are allowed to ride only on asses in the city of Kahira, and from these they must alight whenever they meet a Bey, or any other Mohammedan of importance. These gentlemen never appear in the streets except on horseback. One of their insolent servants goes before, with a thick stick, and calls out to every Jew or Christian he meets riding on an ass, (unless he dismounts of his own accord,) 'Dismount!' If the command is not instantly obeyed, the servant often lets him feel the effects of his reluctance, without waiting to remind him a second time to pay the required homage to his master.

"A few years ago a French merchant was crippled for life, on one of these occasions. Our physician was insulted because he did not dismount quickly enough. This renders it impossible for any European to ride out here without a man who knows all those persons who claim the right to force people of a different religion to dismount. I rode at first with a Janizary before, and a servant behind, me. Both were Mohammedans, and remained seated, while I was compelled to alight. This annoyed me still more than the humble reverence I was obliged to show to the great men, and I afterwards went almost constantly on foot. Christians and Jews are also forbidden to ride past the mosques, and many other public buildings. Some, they are not even allowed to pass on foot. Yet I never could ascertain whether there was any positive law prohibiting them from riding on horseback in Kahira. Not many years ago there was a rich English consul in this city, who dressed like a wealthy Turk, and constantly rode on horseback. His fortune enabled him to visit all the Turks of distinction, and to entertain them in return. As he rode along the streets, he distributed alms largely, and became very popular. The consuls now ride on horseback only on the days on which they have audience of the Pasha. They are then very richly and splendidly drest in the European fashion. I do not wonder that they are compelled to hear so many insulting expressions from the people on these occasions, for our short and straight clothing is, in the eyes of all eastern people, highly indecorous for a man of any respectability, and gold and silver are never seen on their garments. But all other times the Consuls wear the long Turkish dress, and are obliged to do like the eastern Christians and Jews, to dismount at the appointed places, or when they meet any distinguished Turks."

Niebuhr's accounts of the agriculture, the products, the implements and machinery, the trade and manufactures, the dress, manners, and amusements of the Egyptians, are full of interesting, clear, and accurate detail, and are, above all, marked by that perfect fairness and anxiety in no degree to exceed or warp the truth, which was, perhaps, his most striking characteristic. We have space only for a few sentences relating to the trade in gum arabic:—

"Among the products with which the Europeans are conversant, is the so called gum arabic, which the Arabs yearly bring to Kahira, in the month of October. They come in two or three small caravans, and the quantity is from six to seven hundred quintals. The trade is entirely in the hands of Mohammedan merchants. The Arabs never bring their wares into the city, but remain about a mile from Kahira, and the merchants must consent to go to them. They do not sell their gum by weight, nor do they show any samples, but keep it in untanned and closely sewed skins. They very rarely suffer a buyer to cut open these skins before the bargain is quite completed, and if any objection is afterwards made to the quality of their gum, they never take it back. Some of these Arabs mix little pebbles, sand, and bits of wood, with their gum. It might happen that they might afterwards be caught in the city, and probably for this reason: they give no credit, but exchange their gum for clothing, arms, or whatever they want, and immediately return to their deserts. I know not whether the Arabs deserve most the reproach of cheaters or of inexperienced dealers. They love freedom and few words. If they understood the art of spreading out their commodities, and calling to all passers by to look at them, those at least who had clean and good gum to sell would get a much higher price for it than they actually do. Most of it goes to Leghorn and Marseilles. In the months of April, May, and June, come many caravans from Africa, with three different sorts of gum, with elephants' teeth, tamarinds, slaves, parrots, ostrich feathers, and gold dust. They exchange these for linen, glass beads, coral, amber, sabres, and all sorts of clothes, which the Kahirians make according to the taste of the Africans."

The following is his description of the outfit of himself and his companions for their expedition to Mount Sinai.

"We had made careful provision for everything which we thought necessary for the journey before us; we had abundance of eatables, a tent, and beds. Most of the utensils carried on expeditions in these countries have already been described and drawn by other travellers; and, indeed, some of them are so convenient, that they might be introduced into European armies with great advantage. Our little kitchen apparatus was of copper, well tinned inside and out. Our butter we carried in a sort of pitcher made of thick leather. Table-cloths we did not want. A large round piece of leather was our table. This had iron rings attached to its edge, through which a cord was passed: after dinner it was drawn up, slung over a camel, and thus served the double office of a table and a bag. Our coffee-cups (saucers we had none) were carried in a wooden box covered with leather, and wax candles in a similar box, inclosed in a leathern bag. In the lid of this box was a tube, which was our candlestick. Salt, pepper, and spice we also kept in a little wooden box, with several lids screwed one over another. Instead of glasses, we had little copper cups, beautifully tinned within and without. Our lanterns were of linen, and could be folded together like the little paper lanterns which children make in Europe, only that our's had covers and bottoms of iron. Each of us was furnished with a water pitcher of thick leather, out of which we drank: and as we sometimes found no water for two or three days, we carried a good many goat skins filled with it. We also took two large stone water-jars with us, that we might be able to carry water ourselves on the journey from Suez to Djidda. Our wine we kept in large glass flasks, each holding twenty of our bottles. These vessels appeared to us the best for the purpose; but when a camel falls, or runs against another with his load, they easily break, and therefore travellers in the East would do better to put their wine and brandy in goat skins. The hides which are used to contain water have the hair on the outside, but those for wine have it on the inside, and are so well pitched, that the liquor acquires no bad taste. And if Europeans do at first feel some disgust at drinking what has been kept in such vessels, they are, at least, freed from the fear of losing their wine, as we did. Wood or coals travellers seldom take with them. At the places where the caravans halt, they generally find the dried dung of beasts, and this they use as firing when they can procure no wood or sticks in the neighbourhood."

In October the party set sail for Suez, on board a Turkish vessel; they landed at Djidda, and reached Loheia, the first point of their proper destination—the country of Yemen—at the end of the year 1762. On this journey Niebuhr made astronomical, geographical, and geodætical observations, as often as possible, and made some inquiries respecting the currents. Out of these laborious investigations grew the chart of the Red Sea, which, with reference to the circumstances under which it was made, and the means at his disposal, may be regarded as a masterly work.

After some stay in this agreeable town, the party, especially Forskaal and Niebuhr, travelled through western Yemen, in various directions; the former botanizing, the latter ascertaining the geographical situation of places. They then returned to the sea coast to Mokha, where Von Haven died about the end of May, 1763.

At the same time Niebuhr was again attacked by dysentery, and was only saved by the greatest care and temperance. After many delays and difficulties, and before he was perfectly recovered, he set out, undismayed by the danger he ran, with the rest of the party, for the capital, Sana. The climate, and numerous annoyances, which Forskaal had partly brought upon himself, partly aggravated through his caprice, brought on a bilious disorder, of which he died at Jerim, on the 11th of July, 1763.

Niebuhr was the more depressed at his loss from his own protracted illness. He set out, with the two survivors, on the road to Sana, but without the slightest hope of returning, and fearful that no precautions could ensure those papers which were not left in the care of his English friends at Mokha, reaching Europe. This was a source of much greater anxiety to him than his life, to which he never held with any very great eagerness. He feared the entire frustration of the object, and, with good reason, the injustice which might be done to his and Forskaal's discharge of their duties. This was the only point of time during his whole expedition at which his spirits completely sunk.

At length he found himself in that state of dull resignation into which Europeans in the torrid zone generally sink, when under the influence of sickness and depression. He, who, both earlier and later in his journey, struck into the most toilsome path on the slightest rumour of an inscription or a ruin, could not now be stimulated to quit the high road to copy the Hamjarish inscriptions at Hoddafa;—an omission which any one, who imagines himself in his place, will easily excuse him for; but for which he used bitterly to reproach himself after a lapse of fifty years.

From the same causes the survivors declined the cordial and friendly invitation they received to pass a whole year in Sana and Upper Yemen; which would have been quite agreeable to the original plan. They hastened, on the contrary, to reach the coast before the English ships sailed. Their haste was much too great, for they had to wait the whole month of August, and more, before the vessel in which they were to sail was ready. Mokha, situated in the arid desert of Tehama, is, during summer, a horrible residence, and but few days elapsed before the surviving travellers and their servant were attacked with the fever of the climate.

Bauernfeind and the servant died at sea. Cramer reached Bombay, languished for some months, and died. Niebuhr was saved by that extreme abstemiousness which renders a tropical climate as little dangerous to Europeans as to natives. While he was labouring under the dysentery, the physician had told him to abstain from meat, and to eat nothing but bread and a sort of rice soup. This regimen cured his illness. At the end of several weeks the physician learnt, with astonishment, that Niebuhr was patiently continuing a diet by means of which few Europeans could be induced to purchase their lives, even when labouring under dangerous illness.

The merchant to whom the ship

which conveyed Niebuhr from Mokha to Bombay belonged, was Francis Scott, a younger son of the Scotts of Harden, a jacobite family of Roxburghshire. He became his intimate friend. "Five and thirty years afterwards," says his son, "when I studied in Edinburgh, I was received, in all respects, as one of the family in the house of this venerable man, who then lived at his ease in the Scottish capital, on the fortune he had acquired by honourable industry.

"The reception he met with from the English was extremely cordial. Bombay was, indeed, in a very different state from that which it now exhibits. The governor, instead of being a highly cultivated and scientific man, like many of those who have since filled that office, was, in conformity with the old system of the Company, a factor, who had risen by service; the council were men of low education and habits; the officers, for the most part, were men of various nations, who had entered an obscure service as a refuge from disagreeable adventures, or from indigence. Yet, even in this infant colony, the noble English spirit was not imperceptible; and, besides Scott, there were many in whom the vigorous, sensible, upright national character had wrought out for itself an education which cannot be given.

"In Egypt, Niebuhr had first learned to delight in the society of Englishmen; and there was laid the foundation for that mutual attachment, which was permanent, and of which I shall have occasion to speak more hereafter."

Among his most intimate friends were Captain Howe, of the Royal Navy, brother of Admiral Lord Howe, and of General Sir William. From him he received some admirably drawn charts of the Indian seas, and detached parts, roads and harbours of the south-eastern coast of Arabia. He had great pleasure in being able to requite his friend's gift by another, which might serve as a token of his gratitude to the English nation for their hospitality: this was, a copy of his maritime chart of the Red Sea which he had completed at Bombay, and which, from Djidda northwards, was new to the English, no British vessel having as yet navigated that sea. A few years afterwards they attempted the navigation of it with the aid of this very chart. Since that time it has been greatly improved and perfected by Englishmen: the eastern shore by Sir Home Popham; the western, which in Niebuhr's chart is deficient, by the expedition planned by Lord Valentia; the groundwork of these now perfect charts is, however, his.

At Bombay, Niebuhr learned the English language. He also endeavoured to acquire all the information possible from the Parsees and Hindoos, visited the excavated pagodas of Elephanta, and made drawings of the sculptures.

Lastly, he employed himself in arranging his journal, and sent a copy of it through London to Denmark. He also made use of an opportunity to visit Surat.

It was originally settled that the travellers should return by India: when, however, the inclinations which had first prompted Niebuhr to undertake the journey had returned in full force with the return of health, this plan displeased him, and he determined to make his way back overland. To achieve this, he was obliged to relax a little from the intense and wearing application to his original pursuit. From the time he quitted Bombay, where he learnt the death of his friend Mayer, (without whose examination and sanction he did not dare to trust himself, as he might and ought,) he gave up his observations for the longitude; to which he was further induced by the death of his Swedish servant, whom he had taught to assist him in the mechanical part of the observations. This is greatly to be regretted, for Persia and Turkey in Asia still present a wide and untrodden field for observations of this kind. Those who saw what pain this gave him in his old age, rather felt inclined to love and admire his zeal and modesty, than to lament the omission of a work he so much desired to perform.

In December, 1764, after a stay of fourteen months, Niebuhr quitted Bombay, visited Mascat, and made himself acquainted with the state of the remarkable province of Oman. He, however, did not remain there long, but went by Abushehr and Shiraz to Persepolis.

The drawings of the ruins, inscriptions and bas-reliefs of Persepolis, made by three preceding travellers, had forcibly drawn Niebuhr's attention to them as the most remarkable monument of eastern antiquity: no other, either in Asia or in Egypt, awakened such well-grounded hopes of being able to understand and interpret historical records by a discovery of the meaning conveyed in the symbolical sculptures; and his acute and experienced eye immediately taught him the incompleteness of all the existing drawings. Nothing of all that he had seen in Asia raised his expectations to such a pitch; he could not rest till he reached Persepolis, and the last night of his journey thither was perfectly sleepless. The picture of these ruins remained during his whole life indelibly engraven on his mind—they appeared to him the crown and glory of all he had seen.

He passed between three and four weeks amidst them, in the desert, in unremitting labour, measuring and drawing the fragments. The inscriptions on the walls, which were at a considerable height, were distinctly legible only when the sun shone upon them; and as in this climate the hard polished black marble is not corroded by weather, his eyes, already greatly enfeebled by incessant labour, were attacked by a very dangerous inflammation. This, joined to the death of his Armenian servant, compelled him, in spite of his strenuous resistance to these complicated difficulties, to abandon the ancient sanctuary of Persia before he had thoroughly exhausted its treasures.

He returned by way of Shiraz and Abusheher, and from thence across the Persian gulf to Bassora. In Persia he collected historical documents concerning the fate of this unfortunate country, from the death of Nadir Shah up to his own times. With these he conferred a value little known on the German translation of Jones's History of Nadir Shah, the original of which was written in French. The information concerning that period furnished either by Olivier, or by Sir John Malcolm, is not (to use the most modest language) more valuable than that for which we are indebted to him.

In November, 1765, he went from Bassora through Meshed Ali and Meshed Hussein, two places of resort for pilgrims, but hitherto unvisited by any European, to Bagdad, and from thence through Mosul and Diarbekr to Haleb, where he arrived on the 6th of June, 1766. He was now perfectly at home: since he had been alone, he had been at liberty to conform, without molestation, to oriental manners and customs. He was, moreover, now living in a perfectly healthy country, and was as well as at any period of his life.

During this year and a half he had had scarcely any intercourse with Europeans, except at the remarkable Dutch establishment at Karek. In many of the large Turkish cities he visited were convents of Catholic missionaries; these men he regarded with the utmost aversion as disturbers of the tranquillity of the unfortunate native Christians, and of course shunned them. That among these missionaries, by far the greater number of whom were quarrelsome, malignant and ignorant, there were some scattered instances of such sanctity of life as is rarely to be met with in any other class of men, he bore ready testimony. At Bagdad he had become acquainted with Father Angelo, who had nursed many thousand people of every nation and religion in the plague, and whose life had been saved by a crisis which, to pious minds, appeared miraculous, when he was himself attacked by that frightful disease.

At Haleb, however, he found himself in a numerous society of consuls and merchants of all the nations of Europe, in consequence of the profound peace, living in undisturbed harmony. Some of them were married, and their houses afforded the charm of European domestic life, under the directing hand of woman.

His dearest and most intimate connexions were here also with Englishmen. Here he became acquainted with Dr. Patrick Russel, the author of the work on the Plague, and editor of his uncle Alexander's Description of Aleppo. "This respected friend of my father," says Mr. B. L. Niebuhr, "I had also the satisfaction of knowing many years afterwards, and of hearing from him many histories of by-gone days, told with a heart overflowing with the warmest affection and veneration."

Count Bernstorf had very readily consented to the extension of Niebuhr's journey. When this became generally known, the Count was solicited to allow him to visit Cyprus, for the purpose of copying again the Phœnician inscriptions at Citium, which might be supposed to be at least as incorrectly copied by Pococke as the Greek ones which he has given. He found no such inscriptions; and was inclined to suspect that those in question were only old Armenian inscriptions, (like some which he himself met with at Saline near Larneca,) badly copied by Pococke. It appears more probable that the stones had, in the interval, been removed.

An opportunity of going to Jaffa tempted him to visit Palestine, the geography of which was entirely undetermined by any astronomical observations, while no authentic ground plan existed of the topography of Jerusalem. In this he had made as much progress as the time permitted, in the beginning of August, 1766, when he retraced his steps to Jaffa, made an excursion from Sidon over Mount Lebanon to Damascus, and then returned to Haleb.

Five months and a half after his first arrival at Haleb, on the 20th of November, 1766, he set out to return directly home. He went with a caravan as far as Brusa. Lesser Asia, the land on the coast lying open to the south, excepted, is very cold in winter; and on the table-land of Mount Taurus our traveller suffered as much from frost, piercing winds and snow drifts, as he could have done in a winter journey in northern regions. In the warm and beautiful Brusa he reposed from this suffering, to which he had long been a stranger, employing his leisure, as usual, in working at his journal and charts. He reached Constantinople on the 20th of February, 1767.

He passed between three and four months in the capital of the Turkish empire, with which six years before, sick and a stranger in the east, he had been able to make himself but imperfectly acquainted. He had now seen many Turkish provinces, and knew their institutions and the revolutions which had taken place in them. In the capital he sought and gained information as to the general government and military establishments of the whole empire. His treatises on these subjects, remarkable for their solidity and completeness, are printed. Turkey in Europe can furnish attractive occupation only to scholars, to whom it is not Turkey, but Greece and Macedonia, and whose eye and imagination are ever in search of vestiges of past glory and greatness. Niebuhr travelled rapidly, through insecure and almost impracticable roads, to the Danube, and but little more slowly through Wallachia and Moldavia, in the capital of which latter the plague was then raging. About the middle of July he once more set foot on Christian ground at Zwanick.

King Stanislaus Poniatowsky, a man of refined and literary tastes, and imbued in the highest degree with that veneration for knowledge and science which characterized his age, had made known to the Danish government his wish that Niebuhr should direct his course homeward through Poland. He received the distinguished traveller with the manners of a polished gentleman, who takes the utmost care that his guest should not feel that he was invited as a curiosity. He effectually succeeded in winning our traveller's heart, and for many years a correspondence was carried on between them. Niebuhr, who had been so long without any intelligence from Europe, and knew nothing of what had been going on there, when civil war broke out in Poland, regarded the confederates as rebels, and his royal friend as a persecuted, but legitimate and excellent monarch.

On the way from Warsaw he visited Göttingen and his beloved native place, where the death of his mother's brother, during his absence, had left him in possession of a considerable marsh-farm. He reached Copenhagen in November, and was received by the court, the ministers, and men of science with the greatest distinction. Count Bernstorf, who knew how to appreciate him in every respect, and who moreover considered his own honour, as projector of the expedition, implicated in the manner in which it was achieved, appeared to wish to prove his gratitude to him by the most friendly and cordial reception. Niebuhr was intimately acquainted with him, and through him with his immortal nephew, the second Count, and with the Dowager Countess Stollberg, and her sons, then boys *.

Klopstock and the domestic friends of the minister were also in habits of intimacy with him. His own dearest and most confidential friends were Professor Krazenstein and his excellent wife.

His first business was to submit his accounts for inspection. From these he could not himself ascertain the whole cost of the expedition, since they did not include all the preparatory expenses; and it appears that he had neglected to procure for himself a copy

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* The Counts Stollberg remembered how Bernstorf used to communicate Niebuhr's letters to their mother, and what a treat the reading of them was to themselves. These letters contained many lively traits which their author either did not think proper to insert in his journal, or omitted in writing his description of his journey, regarding them perhaps as trivial and of no importance to science. It is much to be regretted that we have not been enabled to avail ourselves of them for this biography.

of the general account. None at least was found among his papers, and he quotes another authority to prove that the whole expedition cost only 21,000 reichsthalers—(3,780*l.* sterling.) We recollect having heard another sum stated at Copenhagen, but it was very little higher; probably some information on the subject may be found in the Kiel journals of the time. The expense, on any calculation, was so extremely small as to excite the greatest astonishment. It would necessarily have been much greater had not Niebuhr been the sole survivor for nearly the whole of the last four years; but, although the sources of expense were thus greatly diminished, they were still more so by his scrupulous integrity;—not only in avoiding every outlay not essential to the object, but in paying out of his private pocket for everything which could be regarded as a personal expense.

"A far heavier account," says he, in the notes of his life which he wrote for his immediate friends, "was that which I had now to render to the public concerning my travels." The materials in his journal and papers were extraordinarily rich and various. That he now laboured at their arrangement and completion with all the truth and simplicity natural to him, will readily be believed; his distrust of his ability, however, amounted almost to despondency. We have already seen how he had grown up to manhood almost entirely without acquaintance with literary pursuits: nor was this all; he had read little connectedly, especially in German. The high German, or written language of Germany, was not his mother tongue; it was only as a young man that he had familiarized himself with it, nor was he ever master of it in all its extent and richness. But he was still more afraid lest, from want of learning, he should state facts in an erroneous or incongruous manner, and consequently be misunderstood and unfairly judged.

His first notion was to publish two works before he published his travels, the one consisting of replies to the queries addressed to the members of the expedition, to be extracted from his own and Forskaal's papers, the other of a collection of all his astronomical observations.

It might certainly have been expected that some queries would have been digested and given to men whom Michaelis was sending to explore new countries, and that a solution of them would have been demanded. So far, however, was this from being the case, that more than four years after the first conception of the project, when the expedition sailed from Copenhagen, he had prepared only two very insignificant questions; the remainder they received, at three several times, on the journey.

Incomparably more important than any of these, was the paper containing topics of inquiry concerning the history of Yemen, compiled by the *Académie des Inscriptions et Belles Lettres*, with that true oriental erudition for which France had long been distinguished. A translation of them is to be found in Niebuhr's works, after the queries of Michaelis. As the latter are well known, the public can judge whether they deserved answers, and whether it was possible to answer such questions satisfactorily. The philologist of the expedition was, at all events, totally incompetent to the investigation; it was Forskaal, indeed, who took it upon himself, and who, from the diversity of his talents and knowledge, was the only person at all fitted to it. As long as he lived, Niebuhr, who understood nothing of Hebrew, regarded these inquiries as only indirectly connected with his pursuits; though, indeed, he neglected nothing which could be of the slightest utility to science. When, however, he remained the solitary survivor, he spared no labour in collecting answers to the queries. He thus fulfilled, to the utmost extent, all that could be required of him. To him, what was accomplished appeared very little, and the extreme modesty of the expressions in his preface ought to have disarmed even such enmity as that displayed in the attack upon him in Michaelis's biography.

As he now thought, and with justice, that these answers were too insignificant to form a work distinct from his great one, there were other causes which decided him not to publish the astronomical observations separately.

His fears concerning the accuracy of his lunar observations, and the calculations founded upon them, have already been mentioned. Had Mayer lived, he would have examined them, and, once assured of their accuracy by him, Niebuhr would certainly have published them with perfect confidence. He, however, could now find nobody on the continent who was master of Mayer's method, and willing and able to tranquillize his fears and encourage his diffidence by examining them.

It was also a most adverse circumstance for him that Father Hell, who had been sent to Wardöhuus to observe the transit of Venus in 1769, was then staying in Copenhagen. Father Hell was unquestionably an able astronomer, but prone to depreciate and to thwart the works of all other men. This accounts for his having taken pains to decry the quadrant which Niebuhr had constantly and most ably used, as an imperfect instrument;—a matter upon which he completely altered his tone when he took this very instrument with him to Norway. He was a declared enemy to Mayer's method; and as Niebuhr, with all the humility natural to him, acknowledged his superiority as a scientific astronomer, Father Hell took advantage of this to increase his diffidence as to the value of his observations, and to maintain that the only certain method of ascertaining the longitude was by the eclipses of Jupiter's satellites. Niebuhr had also made some observations of these eclipses. The scientific readers of his travels will recollect that the longitude of Loheia is determined by them, and that he ascribed the calculation to Father Hell. The impression which the crafty jesuit made upon his mind with respect to his lunar observations, was in the highest degree unfortunate. He had not, indeed, lost his own faith in his observations, but he now feared doubly for the reception they would meet with from the public, and thought he should be compelled to abandon them until somebody should be found who would examine and verify them. This was afterwards done by Bürg.

He now came to the resolution to work up his materials in the form in which they afterwards appeared. For the publication of these two works, Bernstorf procured him very liberal support from the Danish government. All the copper-plates were executed at its cost, and given to Niebuhr. The rest of the expenses he defrayed, having adopted the unfortunate plan of publishing the works himself.

While he was occupied in preparing his description of Arabia, the political circumstances of Denmark changed in a manner the most painful to him. Struensee had got possession of the government, and even of absolute power, and Count Bernstorf was dismissed. Niebuhr did not think fit to take upon himself the character of a public man; his desire on this, as on other occasions, was not to be conspicuous; but he was far from disowning his warm attachment to Bernstorf at a time when all the timid fell off from the discarded minister: Niebuhr, with a very small number of faithful friends, accompanied him to Roeskilde. He never deigned to pay a visit to Struensee, nor would he appear in any place where he was likely to meet the mischievous despots of that unparalleled epoch. He spoke his mind freely; he rejoiced when the people rose against the enemies of their country, and shared the triumph of their downfall.

The Description of Arabia appeared at Michaelmas, 1772. A book of this kind could not become popular; it was, indeed, fitted only for the few. It is, however, difficult to understand how a critic could be found with effrontery enough to write such a review of a book so truly classical, so full of information, and, at the same time, of modesty, as that which appeared in the Lemgo Scientific Journal. It was manifestly dictated by a desire, not to enlighten the public, but to destroy the book. Personal hostility had blinded the writer, or envenomed his mind; he, however, attained his end—he deeply wounded an unpractised author, whom the cool reception of the public had already sufficiently discouraged.

Niebuhr expected that his work would excite a more lively interest abroad than in Denmark; and the appearance of the French edition, which he published the following year, seemed well calculated to realize his expectations. In publishing this, however, two great errors were committed, which increased the influence of the adverse star that presided over all his literary undertakings. The translation ought to have appeared at the same time with the original. Time had now been given for a Dutch publisher to make the same speculation, and the two translations came out at the same time. But however bad and impure was the French of Holland, and to however small a portion of praise the translation which appeared there is entitled, it unfortunately happened that the one made at Copenhagen by a refugee priest was much worse. So utterly unreadable, indeed, was it, that nothing but its novelty could have procured it any notice whatever. Niebuhr, who understood only just so much of the language as was necessary to make himself understood, was unhappily no judge of this, and threw away all the money this abortive undertaking cost him.

At this time a sort of diplomatic messenger, sent to several of the northern courts of Europe by the Pasha of Tripoli, arrived at Copenhagen. His name was Abderrahman Aga. The object of his mission was to beg those presents for his master, which the feeble government of Tripoli had no longer power to extort. It was also a favour conferred upon the ambassador, who was entertained at the cost of the courts he visited, and received presents for himself. The Danish ministry had assigned him a man as companion and attendant, who had formerly been consul in Barbary, and was supposed of course to understand Arabic. The Tripolitan, who was a very intelligent man, found him extremely dull, and almost entirely ignorant of the language he was employed to interpret. Niebuhr, who cherished the feelings of a countryman towards all orientals, visited Abderrahman. He was delighted with an opportunity of speaking and hearing Arabic, of reviving his already diminished facility in it, and of gaining from a native, information concerning the regions where that language is spoken which he had not visited. From him also he gained much interesting intelligence of Tripoli and Barbary. The details which he gathered concerning middle Africa were of a much more important kind; and are the first calculated to throw any light on those unexplored regions, collected since the time of Johannes Leo Africanus.

During two centuries and a half the numerous Europeans who returned from the northern coast of Africa and from Egypt, had not contributed the smallest addition to the stock of knowledge on this subject; and geographers could only, with different degrees of critical acuteness and of intelligence, compare and adapt the accounts given, at an interval of four centuries, by Sherif Edrisi, and by Leo. D'Anville's acuteness in divining the geography of Africa, viewed with reference to the extreme poverty of the data, appears perfectly marvellous. Niebuhr's details were collected sixteen years before that passion arose in England for the discovery of Africa, which has since led so many travellers thither. Their accuracy has been wonderfully confirmed, and they afford one of the most convincing proofs of his talents for geographical research.

Abderrahman Aga visited many of the countries and capitals of Europe, but Niebuhr was the only man then to be found who knew how to turn this opportunity to the account of science. His testimony was most valuable. He had not, indeed, crossed the Sahara, or visited Negroland, but he traded thither; and besides the interest which he took in the country as a merchant, he had that ardour for geographical research which is very extensively diffused among the nations of the east, and is promoted by the paucity of their subjects of conversation. He likewise had some knowledge of the Negro languages: from him, and from one of his black servants, Niebuhr collected various specimens of these dialects.

The discovery of two great Mohammedan and civilised kingdoms in central Africa; the Tripolitan's assurance that a traveller, sufficiently acquainted with eastern manners and customs to pass as an Asiatic, would meet with no greater difficulties there than in Arabia, and with less fanaticism than in Egypt; the undoubted good faith and cordiality of Abderrahman's invitation, and of his promise of all possible recommendations and assistance; the consciousness of the knowledge, aptitude, and familiarity which he had acquired, joined to that longing after the deep and solemn tranquillity of Eastern lands, which other Europeans who have been long resident in them have felt;—all these causes united, awakened in his mind so intense a desire to travel by way of Tripoli and Fezzan to the Niger, that he would probably have set out at his own expense, without any assistance from the government, had he not been withheld by the duty of first finishing the account of his travels. Whatever were the countless dangers which threatened him, we are justified in believing that in all human probability he would have surmounted them. The Moorish merchants, who, through the first injudicious visits of the English expedition, became suspicious and jealous, would have received him without any hostile feelings, and for the difficulties of the journey he was as well prepared as an Asiatic. His talents and fitness for the undertaking were too peculiar and remarkable, and too thoroughly tried, not to promise him results greater than those which any other traveller, excepting only Brown, could expect.

But the course of his life was now to be changed. Had he remained single, he would have hastened to finish his work, in order to attempt this attractive adventure; but at this very time he became acquainted with the daughter of the deceased physician Blumenberg, a Thuringian, and was soon betrothed to her. This was his first and only love; and that it was deep and strong is sufficiently proved, by his sacrificing to it the journey of discovery which he had so passionately desired, and the oriental life which was so agreeable to him. He married in 1773. His wife bore him two children, a daughter, and B. G. Niebuhr, the illustrious author of the most learned and valuable researches into the history of Rome which have ever appeared, from whose life of his father this memoir is chiefly taken.

The first volume of his travels appeared at the Easter fair of the following year, 1774. This caused him to visit the fair; but, even had he not been led to Leipzig by business, he would have been induced to go by his desire to become personally known to Reiske. If any man in Germany ever experienced the misery of persecuted excellence, it was Reiske, whose cotemporaries could not but admit, that if any imperfection now and then appeared in his learning, it arose only from the extent and fulness of his genius and imagination; and that what was ill natured and unamiable in his writings, was the offspring of his bitter feelings at being trodden underfoot by the tyranny of literary envy. "It is not without pride," says Mr. Niebuhr, "that I affirm that my father and Lessing were the only men who did honour to him while living: my father publicly bore testimony that, even among the Arabs themselves, he had never met with a man so profoundly versed in their literature."

In spite of the very unfavourable experience he had already had of publishing on his own account, he held himself bound by a sacred duty to his departed friend to publish Forskaal's works on natural history. This acquittal of a debt to friendship occasioned him a greater loss than all his other publications, from the unavoidably small sale of the work. It was impossible to print from manuscripts in so confused a state, nor could Niebuhr undertake to arrange them, totally unacquainted as he was with the natural sciences, and little versed in the Latin language. He entrusted the task to a Swedish man of letters, and paid him a very considerable sum for its execution. This Swede was a strange man, and, among other things, importuned Niebuhr to let the preface appear in his name; his compliance with which was afterwards a cause of great regret to him. The extraordinary value of this neglected and forgotten work has been mentioned.

Already discouraged by the very considerable sums he had either wholly sunk, or, at least, locked up for a long time, in his literary undertakings, he delayed the publication of the second volume of his Travels, which did not appear till 1778. According to his original plan, this ought to have come down to the termination of his expedition; he broke off, however, at his arrival at Haleb. The remainder of the journey, together with remarks on the Turkish empire, on the Mohammedan religion, details concerning Abyssinia which he had collected at Yemen, and those relating to Sudan which he had obtained from Abderrahman Aga; lastly, the whole of his astronomical observations, were to compose the third volume, which he then thought would very soon follow the others, but which never appeared, though he was so often and so earnestly urged to publish it by his friends and admirers. The causes which hindered his complying with their wishes will be stated in the sequel of this narrative.

He lived very contentedly at Copenhagen, in the bosom of his family, and of a small circle of friends; but the loss which he sustained from the retirement of Count Bernstorf was never supplied. Misunderstandings and differences some time afterwards troubled his outward comfort; and as he easily took a disgust at a place of residence in which he had experienced vexations, he began to grow averse to this city, although he had lived happily in it for ten years, particularly as he heard that General Huth intended to send him into Norway on a geographical survey of that country. This mission was extremely distasteful to him; he did not like to be separated from his family, and he could not take them with him into the wild mountains of Norway. He therefore endeavoured to quit the military service, and to obtain a post in the civil service of Holstein. The government acceded to his wishes, and gave him the situation of secretary of the district (*landschreiber*), at Meldorf; an office, the duties of which were not at that time very burthensome. In the summer of 1778, he arrived with his family at that place, in which he remained till his death.

Meldorf, the chief town of the old republic of Ditmarschen, formerly rich and populous, is sunk into obscurity and desolation. It was twice taken, plundered and burnt, both in the successful war of subjugation, and in that of vengeance and liberation, which followed it. This, added to the grievous contributions extorted from it in the thirty years' war, and the famine which arose out of the universal decay in which the country languished from the year 1628, till the rise of the price of corn in 1790, completed its ruin. Numerous vestiges of the good old times are, to those acquainted with its history, melancholy memorials of its lost and irrecoverable prosperity. Quiet and deserted as the place was, it may readily be supposed that it was entirely without the sort of society suited to a man of Niebuhr's tastes and character; for he was, unfortunately, little versed in the learned languages, and he remained a stranger to the excellent man who is still the ornament of the place, until he became indebted to him for the philological education of his son.

Meanwhile he settled his plan of life; built himself a house, the massive style of which showed his love for the plain and substantial dwellings of his fathers, and planted a garden, the fruit of which he was at that time in too delicate health to hope to gather. He, however, outlived most of the trees in it. In these employments, and the acquisition of knowledge of the country, several years slipped away, during which he began to lose sight of the termination of his work; indeed, this daily became a source of increased pain and mortification to him, from an increasing perception of the pecuniary loss it had caused him, and from the great indifference to it which then prevailed in Germany.

At this time, too, he sustained a loss which rendered him, as father of a family, more thoughtful as to the sacrifice of a part of his remaining property for so unthankful an undertaking. A passion for speculation seizes on reflecting and intelligent, but inexperienced, men, as well as on the reckless and inconsiderate; as epidemical complaints attack the strong as well as the weak. During the American war the rage for shares in a joint-stock undertaking prevailed in Copenhagen, and was fostered and heightened by delusive appearances. Niebuhr was one of those who suffered themselves to be tempted to buy Asiatic shares, and wait for a higher and higher premium, till at length they reached a price for which there was no foundation; this ended in their sudden fall, and in the loss of the holders.

Many things now conspired to trouble his tranquillity. He himself, as a native marshman, enjoyed very good health in the air of Ditmarschen; but his wife, like all strangers, had to struggle against continual attacks of fever, and her delicate constitution was thoroughly shaken. Niebuhr had employed himself for many years, though of late with considerable interruptions, in arranging and preparing his works. He now entirely laid them aside. With the same view he had read a great deal; he was now in a place in which no book ever met his eye, which he did not himself procure. The void which this occasioned was extremely oppressive to him and disheartened and indisposed him for his labour: the more so, as the dead stagnation of a place in which no day was ever marked by a new occurrence, was contrary to his nature, to that impulse which had driven him out into the wide world, and to the very varied and eventful life to which he had been accustomed. The void indeed which he felt was one which no books could fill; and, as he did not clearly define it to himself, it hung upon his spirits as a silent discontent. The direction of his mind was exclusively towards the historical knowledge of things which form a part of the existing and visible earth. Even the history of the past ages of the human race was for him a merely subordinate study. From the same peculiar character of his mind, even astronomy, his own proper pursuit, had no charms for him, except as serving to illustrate geography. When he built his house, he had fitted up a room as an observatory, and made observations there and in other parts of Holstein for the sake of ascertaining the situations of places: latterly, however, he discontinued this more and more, and the instruments he had used on his travels were preserved only as relics.

It was a most fortunate and beneficial thing for him that, a few years after he settled at Meldorf, Boie was sent thither as *Landvogt*, or governor of the province. The editor of the "Deutches Museum" had, of course, very extensive literary connexions, and the intercourse between men of letters was then carried on with a vivacity and interest now wholly unknown. On every account, therefore, he was capable of furnishing various interesting matter about which Niebuhr's mind busied itself. An intimate and daily intercourse, which formed part of the regular routine of their lives, accordingly arose between these two men, and, when Boie married, between the two families.

Through Boie's means Niebuhr also became acquainted with men who would otherwise never have visited this remote and obscure corner. In this manner he obtained the acquaintance and the friendship of the celebrated poet and scholar, Voss.

Another and not less considerable advantage which arose out of Boie's residence at Meldorf was, that he possessed a very fine library, which, as editor of the "Museum," he was continually increasing. The greater part of the books were, it is true, foreign to Niebuhr's tastes and pursuits, but there were many which interested and occupied him.

One consequence of this connexion was, that he was stimulated to write many papers, which circumstances called forth, for the "Museum;" and to give treatises to that periodical, which had been intended to form part of his third volume, and were laid on the shelf. This was, in more than one way, disadvantageous to him. It tended to extinguish all purpose of publishing the deficient volume; it dissolved the connexion in the matter, and destroyed its integrity; and was so much given away out of the newest and most important parts. He seldom wrote for the press without constraint, or without dread of committing errors in style. This anxiety was greatly increased by Boie's fastidious criticism. Niebuhr gave him his manuscript to read through, as he had been in the habit of doing to a friend in Copenhagen. He was not, however, content with erasing a few obvious errors, but corrected it throughout with such rhetorical nicety, that Niebuhr was now more than ever convinced of his entire inability to write. In this he was quite wrong; for the style of those of his essays which had not been touched by any other hand, not only characteristically expresses his peculiar modes of thinking, but is remarkable for the simple beauty it derives from the Low German idoms, which sometimes appear faintly, sometimes in undisguised and primitive plainness. To Northern Germans they have a peculiar charm, and none but a taste, enfeebled and depraved by fastidious refinement, could ever take offence at them.

Meanwhile his children grew to an age to require instruction. This he gave them himself. "He instructed both of us," (says his son,) "in geography, and related to us many passages of history. He taught me English and French—better, at any rate, than they would have been taught by any body else in such a place; and something of mathematics, in which he would have proceeded much farther, had not want of zeal and desire in me unfortunately destroyed all his pleasure in the occupation. One thing indeed was characteristic of his whole system of teaching:—as he had no idea how any body could have knowledge of any kind placed before him, and not seize it with the greatest delight and avidity, and hold to it with the steadiest perseverance, he became disinclined to teach whenever we appeared inattentive or reluctant to learn. As the first instructions I received in Latin, before I had the good fortune to become a scholar of the learned and excellent Jäger, were very defective, he helped me, and read with me Cæsar's Commentaries. Here, again, the peculiar bent of his mind shewed itself;—he always called my attention much more strongly to the geography than the history. The map of ancient Gaul by D'Anville, for whom he had the greatest reverence, always lay before us. I was obliged to look out every place as it occurred, and to tell its exact situation. His instructions had no pretension to be grammatical;—his knowledge of the language, so far as it went, was gained entirely by reading, and by looking at it as a whole. He was of opinion, that a man did not deserve to learn what he had not principally worked out for himself; and that a teacher should be only a helper to assist the pupil out of otherwise inexplicable difficulties. From these causes his attempts to teach me Arabic, when he had already lost that facility in speaking it without which it is impossible to dispense with grammatical instruction, to his disappointment and my shame, did not succeed. When I afterwards taught it myself, and sent him translations from it, he was greatly delighted.

"I have the most lively recollection of many descriptions of the structure of the universe and accounts of eastern countries, which he used to tell me, instead of fairy tales, when he took me on his knee before I went to bed. The history of Mohammed; of the first caliphs, particularly Omar and Ali, for whom he had the deepest veneration—of the conquests and spread of Islamism—of the virtues of the heroes of the new faith, and of the Turkish converts, were imprinted on my childish imagination in the liveliest colours. Historical works on these same subjects were nearly the first books that fell into my hands.

"I recollect too, that on the Christmas-eve of my tenth year, by way of making the day one of peculiar solemnity and rejoicing to me, he went to a beautiful chest containing his manuscripts, which was regarded by us children, and indeed by the whole household, as a sort of ark of the covenant;—took out the papers relating to Africa, and read to me from them. He had taught me to draw maps, and with his encouragement and assistance I soon produced maps of Habbesh and Sudan.

"I could not make him a more welcome birthday present than a sketch of the geography of eastern countries, or translations from voyages and travels, executed as might be expected from a child. He had originally no stronger desire than that I might be his successor as a traveller in the East. But the influence of a very tender and anxious mother upon my physical training and constitution thwarted his plan almost as soon as it was formed. In consequence of her opposition, my father afterwards gave up all thoughts of it.

"The distinguished kindness he had experienced from the English, and the services which he had been able to render to the East India Company by throwing light on the navigation of the higher part of the Red Sea, led him to entertain the idea of sending me, as soon as I was old enough, to India. With this scheme, which, plausible as it was, he was afterwards as glad to see frustrated as I was myself, many things in the education he gave me were intimately connected. He taught me, by preference, out of English books, and put English works of all sorts into my hands; at a very early age he gave me a regular supply of English newspapers;—circumstances which I record here, not on account of the powerful influence they have had on *my* maturer life, but as indications of *his* character.

"He entered with the greatest indulgence and interest into the half precocious, half infantine thoughts of the boy; built castles in the air with him; conversed with him upon all the topics of the day, and communicated to him his ideas and views on all subjects that came under discourse. Thus, when we spoke of fortification, he brought out books and plans, and made me draw and measure polygons.

"In the winter of 1788, Herder sent him his Persepolis, the contents of which were extremely interesting to him. This gave him the greater pleasure, as it was the first proof he had received for many years that he was not forgotten by his countrymen—a pleasure mingled with surprise. From that time marks of the estimation in which he was held in Germany, as well as abroad, were continually becoming more frequent."

The war with Turkey, which broke out at this time, occupied his mind intensely, and excited him to write several papers. The warmer was his attachment to the Arabs, and the more the peculiarity of his character led him to regard the Arabs of Medina, Bagdad, and Cordova, under the kaliphs, as the people after his own heart, the more intensely did he hate the stately, unbending Turks—the tyrants and oppressors of his beloved Arabs—and he cordially wished that they might be driven out of that Happy Land, which under their government is becoming a desert.

He could not, however, help grudging this conquest to the French; and, during the expedition to Egypt, his lively acquaintance with what Egypt had been, was, or might become, rendered it impossible to mislead him; it was his persuasion that, from the French, no improvement, no relief could or would come. For it must be acknowledged, that towards the French he had a national antipathy, although he gratefully remembered that in many places in the East they had received him with the most sincere and courteous hospitality; and although he entertained the highest possible respect for their mathematicians and orientalists. At a later period, when the revolution broke out, he beheld it wholly without faith or confidence in any good result, and even with a decided aversion, excited by that national vanity and that want of veracity which were but too obvious and too disgusting to a mind so simple and upright as his. Not that he had any attachment to courts, aristocracies, or priesthoods. He did not philosophize on the subject, but saw in the French nation our hereditary enemies. He rejoiced at the breaking out of the revolutionary war, from the hope that we might regain the several German and Burgundian provinces, which he always, when teaching his children geography, persisted in reckoning as parts of Germany.

The neighbourhood of his native place was one of the reasons which made it particularly agreeable to him to live in Ditmarschen. Of his relations, his half brother, Bartold Niebuhr, and his nephew, H. W. Schmeelke, were the nearest and dearest to him. The former, many years younger than himself, an opulent farmer, died unmarried long before him. He was a man of extraordinary capacity, and although he had gone but occasionally to school, and (as everything was easy to him) applied but very little, he had acquired enough of the Latin language to understand the poets. "Uncle, what are you reading there?" said his nephew to him one day, seeing him with the Georgics in his hand. "I have hived some bees," answered he, in the dialect of his country, "and I want to see what Virgil writes about them."

When he saw Niebuhr in his uniform as officer of engineers, he went up to him, looked earnestly at him, and said, smiling, "Brother, you look very well in that dress, but for all that you are a servant—I am a free man." Schmeelke, for some time Bürgermeister (*i. e.* chief magistrate) at Otterndorf, was always Niebuhr's favourite, and before his travels into Arabia he had bequeathed to him the greater part of his property, as his brother did not want it. The uncle and nephew frequently exchanged visits, and Niebuhr was never so happy as in Hadeln. He had no relation, however distant, no connexion of the friends of his early youth, whose circumstances he did not know in their most minute details and treasure up in his memory.

"The appearance of the long-expected travels of Bruce," says Mr. Niebuhr, "formed an epoch in our uniform life. My father had never been one of those who carried scepticism so far as to question whether Bruce had ever been in Abyssinia at all. He read his work without prejudice, and the conclusion he arrived at was the same which is, since the second Edinburgh edition, and the publication of Salt's two journeys, the universal and ultimate one. In a paper which he sent to the new 'Deutsches Museum,' he showed that Bruce had exactly copied the pretended determination of the elevation of the Pole on the Arabian Gulf from himself;—that the conversation with Ali Bey was a palpable fabrication and romance;—that the pretended journey over the Red Sea, in the country of Bab el Mandeb, as well as that on the coast south from Kossir, were also mere fiction. On the other hand, he declared that, mixed up with these gross falsehoods, there were parts of the travels which bore an impress of perfect truth and might be confidently believed. About the same time, he was incited, half in indignation, half in wantonness, to give his opinion on a fantastic dream concerning the origin of the Pyramids and of Persepolis put forth by Witt, who maintained that they had been wholly misunderstood, and were works of nature.

At the beginning of the year 1790, he had the great pleasure of receiving a letter from his old friend Dr. Russel, begging of him his ground plan of the city of Aleppo for the new edition he was about to publish of his description of that city. It is hardly necessary to say that Niebuhr did not refuse it. Dr. Russel greatly improved upon it by the addition of the most remarkable buildings, by more correct drawing of the principal streets, and omission of the remainder. Niebuhr's plans, with the exception of Kahira, which is as perfect as that of any city in Europe, are, as he himself has observed, to be considered complete only as far as the circumference, the gates, and the principal buildings are concerned.

Out of this renewed correspondence with Dr. Russel, arose one with Major Rennell, who wished to avail himself of Niebuhr's unpublished map of his route through Syria and Natolia, with a view to a general map of Asia he had it in contemplation to publish. Niebuhr was too generous and too free from all petty jealousy to hesitate a moment in complying with this request. About the same time, Marsden showed his respect for him by sending him his history of Sumatra.

After the correspondence with Rennell had lasted some time, Niebuhr sent him a few of his lunar calculations, the verification of which he had so extraordinarily at heart, and intreated him to induce Maskelyne to undertake this task: this, however, was not attended with any success.

"I must here," adds his son, "depart from chronological order to speak of his correspondence with two excellent men of letters, which, however, if I mistake not, took place some years later. Silvestre de Sacy, while deciphering the Pehlwi inscriptions at Nakschi Rustam, had discovered the incomparable accuracy of my father's drawings; and he, who always entertained the highest reverence for the author of that masterly philological work, felt grateful to De Sacy for calling into life labours which were dead, so long as the key to them was wanting. A very agreeable correspondence soon arose between two men of science, bound to each other by such ties. Silvestre de Sacy was at that time employed upon the compiled translation of the Bark el Jemen, *i. e.* the History of the Conquest of Jemen by the Turks. In the prosecution of this work he had used my father's geography in his description of Arabia and his map of the empire of the Imaums, and had found the astonishing result that every place mentioned in the history, excepting only two villages in Tehama, were laid down with perfect accuracy. So far as the map was determined by his actual progress through the country, this is less surprising; the remarkable, and the far greater part, is that which rests on the connexion between such data concerning distance and direction as he could collect. Here nothing but the most acute judgment and accurate induction could have enabled him to decide on the internal evidence of varying testimonies, and to give to each its due value.

"Out of this correspondence afterwards arose another, which was also extremely valuable to him—that with the learned, industrious and clear-sighted geographer, Barbier du Bocage. He applied to my father for materials for the construction of his map of Natolia, and received both astronomical determination of places, and itineraries which my father had written down from the oral testimony of the camel-drivers of the caravans."

In November, 1792, Niebuhr was attacked by a pleurisy of which he very nearly died, and recovered very slowly. Fulness of blood, occasioned by the quiet and inactive life he had led for so many years, was the cause of very severe illness and of long derangement of health. The following year he spit blood. He was not absolutely ill, but his spirits were extremely languid and depressed: he complained of oppression on the chest, and indisposition to move. He had another complaint which made him very anxious. For several years a sort of wart or wen had been growing under his right eye, and every means resorted to had only inflamed and increased it. The surgeon whom he consulted thought it alarming; the more so because he dared not venture on an extirpation. After enduring pain and anxiety for some years, it was at length cured, and at the close of his sixty-sixth year he was happily restored to perfect health. An accident led him to purchase some moorland, a league from his house, and to undertake the cultivation of it. It revived all his taste for the employment of his early life; he laid various schemes of agricultural improvement, pursued them with youthful ardour, and promised himself the most favourable results: he planted trees, cut drains, and bought land till he had altogether a very considerable estate. The consequences were not answerable to his hopes; a great deal of money was lost—if, indeed, that can be called lost which not only left the land improved and productive, but lengthened and enlivened his remaining days.

He took much and strong exercise, went to his farm on foot or on horseback, returning with unwearied activity to every spot where anything remained to do. As the fields in that part of the country are divided by very broad ditches, he made use of a leaping pole, to which he had been accustomed in his youth. He had grown so young and so robust, that he jumped over a ditch ten feet wide in his seventieth year. His farm made many things interesting to him which had formerly been indifferent, and his peculiar talent for observation and investigation found animating employment and food. He studied, in the greatest detail, the sort of agriculture suited to the marsh and heath lands of his own district and the neighbouring ones on the same side of the river, and all the long-forgotten knowledge of the subject which he had acquired in his youth from personal observation revived in his mind. "I still hope," says his son, "to obtain possession of a series of letters from him, written in the year 1801, in which most careful inquiries, he replied to a list of queries I addressed to him on the different kinds of marsh-land, the under strata, the proportion between the seed and the produce of various sorts of grain, and the fundamental rules of the old valuation of the land, with a precision and copiousness to be expected only in replies to the interrogatories of a committee of the British House of Commons.

"Still later, in 1809, in the 77th year of his age, he surprised me by a collection of notes in answer to the inquiry whether, before the existence of the marshes along the whole coast of Friesland, from Jutland to the Vlie, there had been moors extending behind the *Dunes* or Denes, which are now washed away; as also, in answer to the question, whether the mean height of the tide were always the same, and had not, for a long series of years, been continually gaining, or were subject to long periods of gaining and losing. These queries were contained in a letter addressed to him from Holland. The facts which he brought together in reply, gave evidence of all his peculiar acuteness and accuracy of observation.

"These occupations diverted him from dwelling on a misfortune which had been a source of great vexation to him for some years before he devoted himself to them. The copperplates belonging to the works which had appeared, as well as those executed for the yet unpublished volume, were deposited at Copenhagen, in the house of a friend, which was reduced to ashes in the great fire of June, 1795. All these plates were destroyed; and with them perished all desire, all heart, for the completion of the unfinished volume.

"An opportunity did, indeed, shortly present itself for the publication of its contents, though not in Germany. In England his reputation was so high, that almost every body who heard my name accosted me with cordial inquiries for my father, and an acquaintance with his works was so widely diffused through the medium of Heron's extracts, that I met with them in the houses of several country people, and a friend of mine found them even in the island of Mull. Very eager inquiries were now addressed to him from that country, whether he would not publish the deficient volume there, and in the English language. This he declined, partly because he anticipated more difficulties from the sending over a copy of the manuscript for me to translate than really existed; but partly, also, because with all his attachment to England, he thought it unbecoming and wrong to suffer the conclusion of a work which might be considered as the property of the Danish government, to whom it owed its very existence, to appear in any other country than Denmark, or in any other language than German. At subsequent periods the same proposal was renewed to me, first in 1802; and when I saw that all hope of his giving a German edition was at an end, and at the same time that he was fully satisfied of the correctness of his geographical and astronomical observations, I earnestly entreated him to send me the MS. and to permit it to be translated. My intention was to append to it a translation of the history of Zebid, which he sent to Copenhagen, together with other MSS., and which is still to be found in the royal library there. It contains a circumstantial history of Yemen, from the time of its separation from the caliphate through the whole of the middle ages. I also intended to extract all that was not botanical from Forskaal's cruelly neglected works, and to annex these, together with a general map of Arabia. My father persisted in his refusal, of which he, however, afterwards repented. During the campaign in East Prussia, Lord Hutchinson, one of his most zealous admirers, made the same proposal to him through me, and offered to negotiate the affair on the most advantageous terms, according to the relations generally subsisting in England between author and publisher. But at that time I had no longer the power of making any historical additions to the description of Arabia; the sending the manuscripts to me, even after the peace of Tilsit, was very doubtful; and the conveying the translation to England, during the tyrannical prohibition of all intercourse, attended with great danger."

In Zach's monthly correspondence Niebuhr found some remarks and criticisms on Mayer's system of longitudinal observations, which he little expected, having scarcely any means of observing the developement and growth of science in the remote corner of the world where he lived. Agreeably surprised, he immediately communicated to M. von

Zach the existence of his own observations, the earliest which had been attempted upon the system in question, and offered to send them to him. The readers of Zach's journal know how this offer was received by M. von Zach and M. von Bürg, and what judgment they pronounced on his determination of places, after they had been calculated according to Bürg's perfected tables: this treasure of the geography of Asia is now on record in the above-mentioned correspondence.

The tranquillizing assurance that he had not laboured in vain, and that he was at length understood and appreciated, was a balm and a cordial to his old age. In 1802 he was further gratified by the distinction conferred upon him in being appointed foreign member of the Institute of France; for although his native dislike to that country had been increased by the tyrannical domination which now pressed so heavily on the continent, he nevertheless acknowledged that, in the sciences to which he had devoted himself, no society could then, for dignity and splendour, be compared with the National Institute.

Another agreeable incident which marked this period was, that an addition to his salary, proportioned to the general rise in prices since his residence in Holstein, was made by the voluntary favour of the present King of Denmark, then Crown Prince. From the time this prince took the reins of government, Niebuhr received marks of distinguished favour from him, without any request or application on his part. Although, perhaps, he owed this principally to his fame as a traveller and a man of science, he had deserved it no less as a public functionary. The business of his office, which consisted chiefly in the collection of taxes and in public accounts, was not indeed very agreeable to him, nor suited to a man of his turn; he however executed it with unwearied diligence and fidelity. The mildness and consideration with which he performed his duty, often at the risk or with the certainty of personal loss, at a time when the growing burthen of the taxes was so great as to convert the industrious peasant into a dilatory payer, won him the gratitude of the people; while the exactness and extraordinary intelligence he displayed in the discharge of his duties, ensured him the respect and applause of the government. Among the concerns committed to his care was one which was peculiarly attractive to him, and which opened a wide field for improvement. This was the superintendence of the out-dikes. He reflected much on the means of promoting and accelerating their increase, especially by draining the *priele* and *sprante* (as the natives call the small channels which, at ebb-tide, are left flowing through the bed of the river), and was unremittingly engaged in drawing up notices and reports with the hope of obtaining approbation and money for the prosecution of the work, the cost of which could be but slowly replaced. In his frequent visits to these lands he was led particularly to observe the very remarkable phenomena exhibited by the successive layers, so to speak, of vegetation, growing one out of another on the gradually increasing additions to the soil; from the plants of the *salsolæ* tribe which grow in the mud deposited by the ebb-tide, to the fine grasses of the mature crust or soil. These had been hitherto unobserved, and if they are now known to naturalists, it is probably through his repeated descriptions of appearances which had been noticed only by the shepherds and husbandmen of these extensive pastures.

From the earliest time of his appointment to his office, up to the year 1802, the duties he had to discharge were nearly unaltered; from that time they increased in proportion as the necessitous state of the public finances gave occasion to an increase of the public burdens. The first of the many fresh taxes which succeeded were the land and usufruct taxes, in the imposition of which the old registers of the country were entirely disregarded, and a new valuation became necessary. In the commission appointed for the district, Niebuhr, from his official knowledge and connections, and from his personal zeal, was the most active, indeed almost the only working member. In order to appreciate what a task this was, we must first conceive a district containing 24,000 inhabitants, all agricultural; the whole land divided into small ownerships, which were smaller in proportion as the marsh was more fertile. Niebuhr revised the valuation himself, and deliberated and decided on the appeals. In his 71st and 72nd years he worked through a great part of the night, nor did his indefatigable zeal relax even when his sight began to fail. The reader will remember how his eyes suffered from drawing at Persepolis. They afterwards sustained a sudden and still more fatal shock from his negligence in not using coloured glass during a solar observation. Egypt and the deserts had also left permanent effects upon them. The consequences of this night-work were irremediable and fatal. In a short time he could no longer see to read, and for writing he required an extraordinary quantity of light, and even then the lines were often run into one another. This blindness, the progress of which he clearly perceived was not to be arrested, made him very anxious, the more, as it threatened to compel him to resign his employment. This he was happily enabled to avoid.

His wife, after many years suffering from asthma, which ended in water in the chest, died in December, 1807. His daughter and her widowed sister, who had lived with her for twelve years, freed from the constant care her illness had demanded, could now devote themselves wholly to rendering him the assistance of which he stood so much in need. His daughter did not confine herself to administering to his bodily wants and infirmities, she did that part of his business which he was no longer able to do. This, however, was not sufficient, as his sight became worse and worse, and what he wrote with the utmost care was nearly illegible.

His family and friends regarded it as one of the best rewards of his honourable and useful life, that, at the close of it, he found a friend who undertook the discharge of the duties of his office with all the devotion and attachment of a son. Gloyer, who became his successor, took a deep and lively interest in statistics, to which we owe his valuable and instructive fragments on India, and on the state of taxation in that country. He was introduced to Niebuhr, who found his society so delightful, that as he was not engaged in any employment, he invited him into his house as an assistant. Gloyer complied with his wishes, and the government acceded to Niebuhr's request that his friend should be officially recognised in that capacity. Gloyer shared the labours of the office; and the tranquillity with which Niebuhr could confide the execution and credit of his post to such a friend and such a daughter were the best rewards for the fidelity with which he had discharged its duties. He felt it to be so. He did not, however, withdraw his mind from his business; he had kept the thread of it unbroken, though he had so long been blind; everything was read aloud to him and discussed with him. Gloyer's conversation and daily intercourse revived to his mind's eye many a faded or vanished picture of the east, and the books which this invaluable friend read aloud to him, and the circumstances he related, put him in possession of the works and statements of more recent travellers. This was without comparison the highest enjoyment of which he was susceptible. "When I related to him," says his son, "the descriptions of any traveller newly returned from the east, or gave him in my letters any accounts of travels not known on the continent, his whole being seemed reanimated, and he dictated answers which showed that his mental vision was vivid and powerful as ever. It was still more remarkable that these new facts imprinted themselves on his mind with all the depth and sharpness with which objects are stamped on a youthful memory, and so remained up to the time of his death. He combined them with what he had himself observed and experienced.

"I was deprived of the happiness of contributing to his comfort or enjoyment by any other means than such communications, which the total prohibition of intercourse between England and the continent daily rendered more rare and difficult of access.

"Among the circumstances which contributed to gladden his old age was the constant intercourse he enjoyed with a family brought up in Meldorf, and nearly related to him, the members of which were like children and grandchildren to him. His friendship with the Treasurer of the district *(Landespfennigmeister)*, Piehl, who, in the management of the concerns of the province, exhibited the rarest combination of sagacity and aptitude, and whose whole character was the perfect model of the citizen of a republic, became more close and intimate in proportion as both advanced in age. A visit from this excellent friend when he returned from one of his journeys into the country, or a visit to his house, where every thing bespoke his active mind and beneficent disposition, were festivals. Piehl was indeed a most remarkable man; a history of his life and of his administration of the finances of the province, into the frightful chaos of which he introduced order; actively and prudently, so far as was possible to human efforts, taking advantage of good times, and correcting the remaining influence of bad ones;—lightening the terrible pressure on the people by the sacrifice of his own property, and the offer of his own credit;—a history of this noble example of public service, for the display of which a free agricultural community managing its own affairs affords the sole field, would be a well-deserved monument to his honour; an edifying and instructive document to all placed in the same circumstances, and to all who entertain sincere and conscientious doubts as to the blessings of a free and democratic government.

"These various mental pleasures and consolations became so much the more necessary from his increasing bodily infirmities. He was of a phlegmatic, robust, and plethoric constitution, to which, from the habit of many years, bleeding had become indispensable. Unfortunately, he conceived the idea that his great age rendered it necessary to discontinue this; nor could any warnings or remonstrances induce him to resort to it again, till at length attacks of dizziness, sudden deafness and spitting of blood showed the danger to be imminent. These symptoms, which began about the time of his wife's death, continued to return with more or less violence every spring and autumn; till, in October, 1813, he was attacked by a frightful bleeding at the nose which, however, his robust temperament enabled him to rise above.

"Sated, though not disgusted, with life, he frequently in the course of this year expressed his willingness to rejoin his wife, whenever God's good time were; yet he wished to live to see the destinies of the world decided, and once again to embrace his absent children. His wishes were granted, though he was first compelled to behold an invading army in Holstein. The distress and terror which such an event always brings in its train, did not overcome his joy at the deliverance of Europe and the glorious triumphs of Germany and her allies

"The camp in Ditmarschen, on the side of a road, whither only light troops were sent, brought upon the country all the terror of an ungoverned soldiery. Meldorf was also in a state of great alarm from a troop of Mecklenburghers, who were used by a rapacious commissary as means of extorting contributions by threats of fire and pillage. To protect Niebuhr against these atrocities, Colonel Von Clausewitz, then of the German Legion, and now chief of the staff of General Count Gneisenau, sent him a guard.

"One of the symptoms of increasing infirmity and a consequence of the sort of attacks already mentioned, was a weakness in one leg, which occasioned him many falls. It was, however, unattended with any important consequences till an unlucky fall, in March, 1814, which injured his right thigh and caused a permanent lameness in it. From that time he was never able to set his foot to the ground; nor could he move without assistance or without pain; he could only be removed from his bed in the afternoon on a wheeled chair. He clung long to the hope of recovery; but even the gradual decline and extinction of this hope could not abate his truly saint-like gentleness and resignation. Gratitude to Gloyer, who helped to carry and move him about, and whose solicitude to occupy and amuse him was unwearied and inventive;—to his daughter, who devoted herself entirely to him;—to his sister-in-law, and to all who showed him any kindness, rendered him happy even amid pain and infirmity.

"It was thus we found him," says his son, "in the autumn of 1814, and his appearance was calculated to leave a delightful picture in the mind. All his features, as well as his extinguished eyes, wore the expression of the extreme and exhausted old age of an extraordinarily robust nature;—it was impossible to behold a more venerable sight. So venerable was it, that a Cosack who entered, an unbidden guest, into the chamber where he sat with his silver locks uncovered, was so struck with it, that he manifested the greatest reverence for him, and a sincere and cordial interest for the whole household. His sweetness of temper was unalterable, though he often expressed his desire to go to his final home, since all which he had desired to live for had been accomplished.

"A numerous, and as yet unbroken, family circle was assembled around him, and every day in which he was not assailed by some peculiar indisposition, he conversed with cheerfulness and cordial enjoyment on the happy change which had taken place in public affairs. We found it very delightful to engage him in continued recitals of his travels, which he now related with peculiar fulness and vivacity. In this manner he once spoke much, and in great detail, of Persepolis, and described the walls on which he had found the inscriptions and bas-reliefs, exactly as one would describe those of a building visited within a few days, and familiarly known. We could not conceal our astonishment. He replied, that as he lay in bed, all visible objects shut out, the pictures of what he had beheld in the East continually floated before his mind's eye, so that it was no wonder he could speak of them as if he had seen them yesterday. With like vividness was the deep intense sky of Asia, with its brilliant and twinkling host of stars which he had so often gazed at by night, or its lofty vault of blue by day, reflected, in the hours of stillness and darkness, on his inmost soul;—and this was his greatest enjoyment. In the beginning of winter he had another bleeding at the nose, so violent, that the by-standers expected his death—but this also he withstood.

"About the end of April, 1815, the long existing obstruction in his chest grew much worse; but his friendly physician alleviated the symptoms which to those around him appeared rather painful than dangerous. Towards evening, on the 26th of April, 1815, he was read to as usual, and asked questions which showed perfect apprehension and intelligence: he then sunk into a slumber, and departed without a struggle."

A concourse of people from all parts of the country attended his body to the grave. It was the opinion of all, that no individual had ever been so universally regretted. The funeral was solemnized with all the honours which respect and affection can pay. He had attained the age of eighty-two.

He was counsellor of state of Denmark; knight of the Dannebrog, of the fourth class; secretary (landschreiber) to the district of South Ditmarschen; member of the society of sciences of Göttingen; of the Swedish and Norwegian societies; and of the society for the investigation of natural science; and foreign member of the National Institute of France.

In stature he was rather under the middle size, of a very robust and sturdy make; up to his fortieth year, thin, but later in life, thick set and fat. There is only one engraving of him extant,—a bad copy of a good picture painted in his youth. It is prefixed to a volume of the *Allgemeinen Deutschen Bibliothek.* His person and carriage, the sturdy looking head, the powerful neck, and his whole gesture, gave him a completely oriental air. When seen from behind in an eastern dress, especially when walking and in conversation, gesticulating with his hands, no man could have distinguished him among a party of Arabs. I have often been struck with this when I have looked after Moors of the Barbary states in the streets.

He was extremely frugal: economy had become a habit with him in early life. As a peasant lad he drank nothing but water and milk; and at a later period he deviated from this simple diet only in compliance with the customs of others, with which he every where made it a rule to conform, and he then drank an extremely small quantity of wine. He had no favourite dishes but the peasant fare of his native land.

He was, and remained through his whole life, *a true and genuine peasant;* with all the virtues, and with the little failings, of the class from which he sprang. He was, unquestionably, somewhat obstinate; and it was very difficult to reason him out of an idea he had once strongly taken up: he continually reverted to it. Equally strong and inveterate were his prejudices for and against men. This pertinacity, however, it was, which gave him strength during the greater part of his life to follow the path he had chosen, through every difficulty and danger. His moral character was spotless, and his manners extremely pure and severe. In every circumstance and relation of life, he was unpresuming and disinterested.

The bent of his mind was entirely for the observation and investigation of sensible objects: abstraction and speculation were foreign to his genius, which could lay hold of nothing but the concrete. With regard to books, he was most rigorous as to the truth of the statements they contained; that form of conveying them pleased him the best which was the simplest. Poetry, except Homer, in Voss's translation, Göethe's Hermann and Dorothea, and songs for music, was quite uncongenial with his tastes. Fielding and Smollett's novels he loved; he had read no others. Architecture interested him; but to the arts of painting and sculpture he was indifferent: music he loved.

He lived in observation and perception. A friend of his own age, who took a short journey with him when both were advanced in life, silently remarked, and afterwards related with great delight, how he had found something to observe and to investigate in every field and every village they passed through. In his sixty-eighth year he visited this same friend in his then residence, where he had never before been. The morning after his arrival he let himself out at the house-door at four o'clock in the morning, and before breakfast had wandered through and around the whole town, and had so perfect and exact a picture of it in his mind, that every house and every building he inquired about was instantly recognised and named from his description.

This exclusive turn of his mind rendered him indifferent to subjects of mere speculation. He advanced towards the unknown regions with the full tranquillity of a conscience " void of all offence" and of all blemish. He relied for the protection of himself and those dear to him on that overruling Providence, of which, in the course of his own life, he had had striking experience. " It is extraordinary," says his son, " that this man, so remarkably devoid of imagination, so exempt from illusion, waked us on the night in which his brother died, though he was at such a distance that he knew not even of his illness, and told us that his brother was dead. What had appeared to him, waking or dreaming, he never told us."

As he had conceived a very high and extensive idea of the duties which devolved upon him on his travels, he never lost the remembrance of the designs he had relinquished, in compliance with the wishes of others, or in consequence of obstacles. He reproached himself for these omissions with a severity which we never could convince him was exaggerated and unjust. In his old age, these self-tormentings assumed a character which gave us great pain. Acknowledgments of his merits by competent and experienced judges, such as Reiske, Silvestre de Sacy, Rennell, &c. gave him the sincerest pleasure: to external honours or homage addressed to his vanity, he was quite inaccessible. Nobility, which was offered him by the minister Guldberg, he refused. The title which he was compelled by custom to assume, as officer of engineers in the Danish army, led a relation of his to ask him, " If he had caused himself to be ennobled ?"—" No," replied he, " I would not offer my family such an affront."

He founded, and bequeathed to his family, a more enduring nobility. To this time no traveller returns from the east without wonder and gratitude towards such an instructor and guide, the first and best of all describers of the east. Not one, of all who have hitherto followed, has equalled him; and it is yet doubtful whether he will ever find a successor, who will complete what he has left unfinished of the description of Arabia, and worthily occupy a place by his side.

SIR CHRISTOPHER WREN;

WITH SOME GENERAL REMARKS ON THE ORIGIN AND PROGRESS OF ARCHITECTURE.

> "ARCHITECTURE HAS ITS POLITICAL USE, PUBLIC BUILDINGS BEING THE ORNAMENT OF A COUNTRY; IT ESTABLISHES A NATION; DRAWS PEOPLE AND COMMERCE; MAKES THE PEOPLE LOVE THEIR NATIVE COUNTRY, WHICH PASSION IS THE ORIGIN OF ALL GREAT ACTIONS IN A COMMONWEALTH.
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> "IT AIMS AT ETERNITY; AND THEREFORE IS THE ONLY THING INCAPABLE OF MODES AND FASHIONS IN ITS PRINCIPLES (THE ORDERS,) WHICH ARE FOUNDED UPON THE EXPERIENCE OF ALL AGES, PROMOTED BY THE VAST TREASURES OF ALL THE GREAT MONARCHS, AND SKILL OF THE GREATEST ARTISTS AND GEOMETRICIANS, EVERY ONE EMULATING EACH OTHER; AND EXPERIMENTS IN THIS KIND, BEING GREATLY EXPENSIVE AND ERRORS INCORRIGIBLE, IS THE REASON THAT THE PRINCIPLES OF ARCHITECTURE ARE NOW RATHER THE STUDY OF ANTIQUITY THAN FANCY."—*Wren*.

CHAPTER I.

Of the Origin of Architecture and the different Styles, and the purposes to which they have been applied.

WE shall preface the account of the life of Sir Christopher Wren, whose name is associated with all that is great in English architecture, with a few general observations on the rise and progress of the art, which will in some measure serve as an introduction to the Treatise on that subject intended to be published.

It is generally admitted that the early architecture of Greece was indebted to Egypt for some of its rudiments; and yet it is impossible to institute the most careless comparison, without observing the very different character displayed in the earliest specimens of Grecian art, and particularly in sculpture. The causes of this diversity it is difficult now to define, although every variety of speculation has been exhausted on the subject.

In all the advances of the art, the principles of the early attempts, which had their origin in necessity, appear to have been constantly adopted in the improvements of the succeeding ages: the dark and ponderous buildings of the Egyptians have a near affinity to the caverns of their ancestors; and the ornamental and elegant architecture of Greece bears striking testimony to the early use of the timber with which that country abounded. In India the original employment of reed and bamboo is discovered in the lofty and slender buildings of later times; in China the roofs are always constructed in imitation of the moveable tents of the aboriginal Tartars; and the same observation applies to Turkish and Saracenic buildings.

One of the peculiar features of Egyptian buildings is, that none of the specimens afford much evidence of variation, either in principle or in the constituent parts, during a very considerable period of time. Without entertaining great admiration for the beauty, the grandeur, or the simplicity of Egyptian structures, it is yet impossible to contemplate without wonder those immense and gloomy monuments of labour, in which, independently of situation and size, a very striking effect is produced by the peculiarity in the arrangement of the different parts, and by their vast groves of columns, obelisks, and colossal statues.

The external character of the Egyptian style is, however, in a great degree simple and imposing; the columns and decorations usually are internal, contrary to the Grecian architecture, in which the interior of the temples is comparatively plain, the columns, the statuary, and other ornaments being nearly all external. This may be traced, in some degree, to the difference of the climate.

In the contemplation of the Egyptian temples, their resemblance to the ancient buildings of India is peculiarly striking; and this naturally leads to the consideration of the discussions to which the early progress of ancient nations in architecture and some other arts has given rise.

In tracing the origin of the arts first practised by man in his progress from barbarism to civilisation, after those necessary to insure his subsistence and clothing, that of providing shelter from the inclemency of the weather must have been the earliest cultivated. It has been frequently remarked, how soon man became acquainted with the means of fabricating cloth; architecture and weaving are amongst the first complicated arts practised by barbarians, and were even at an early period carried to considerable perfection: next to the care of necessaries, the love of ornaments arises in the breast of a savage; and the art of fetching out the brilliancy of the precious stones and metals is, accordingly, one of the earliest which are noted in the progress of a rude people.

Architecture, weaving, and jewellery are the only arts for which the *Hindoos* have been celebrated, and even these, with the exception of weaving, attained but a low degree of perfection. The ancient buildings of Hindostan have been at different periods the subject of wonder, and considered as evidencing a high civilisation: yet there are productions in China of dimensions and importance vying with them. "The Mexicans, ignorant of iron, cranes, and scaffolds, with neither carts nor sledges, and no means of working their stones but with flints, or of polishing them but by rubbing them against each other, accomplished works which in magnitude and symmetry rival any of which Hindostan can boast."

The Pyramids of Egypt, vast as are their dimensions, afford intrinsic evidence of the rudeness of the period at which they were reared. The sepulchre of *Belus* at Babylon, according to *Strabo*, was built of different bodies or stages one rising above another, exactly in the manner of the great Temple at Mexico, as is noticed by Humboldt, who also observed the resemblance between the Pyramids of Egypt and the vast Pyramids the remains of which are to be found in South America. The Palace of Montezuma strongly resembled that of the Emperor of China; and Knox, after remarking the passion of the Cingalese for constructing temples and monuments of enormous magnitude in honour of their Gods, observes, "as if they had been born solely to hew rocks and great stones, and lay them in heaps:" "the unsophisticated opinion," remarks Mr. Mill, "of a sound understanding on operations which the affectation of taste and antiquarian credulity have magnified into proofs of the highest civilisation."*

It is not intended to urge any arguments in detail as to the common origin of the buildings of India and the *Monolithic* (built of one rock) Temple of Egypt. The fact, however, that the Sepoys, in their march to join the army of Lord Hutchinson, conceived they had found their own temples in the ruins of *Dendyra*, is mentioned by Captain Light in his *Travels*, and so convinced were they of the identity, as actually to perform their devotions in them.

Monsieur Legrand, in his very interesting Essay on Architecture, attaches much higher value to Egyptian architecture than it deserves, describing it as "noble, severe, and imposing in the highest degree, and appearing still to resist the destroying hand of time after a lapse of four thousand years;" and he thinks that such ideas were not generated in the infancy of the art, as has been often imagined, but were "the fruits of a long continued civilisation, great knowledge, and a tending to lasting glory." "This elevated style," continues the author, rising with his subject, "which is not sufficiently understood, deserves to be profoundly studied in all its parts, and again adopted by those men whose aim is to astonish the present age, and to ensure the admiration of posterity." That Pyramids will be again built for the admiration of the present or of future ages is not to be feared; and it may be doubted, if Monsieur Legrand will by his eloquence conjure up a hardy spirit, who will undertake the task of handing down to posterity, at a vast expense, the dark and dreary monotony of the Egyptian Temples, at least not till we shall be again reduced to a state of society resembling that in which they lived who commanded them to rise, and till some king shall exist, "whose power being unlimited, is compelled to solace, by the erection of a Pyramid, the satiety of dominion, and tastelessness of pleasures, and the tediousness of declining life, by seeing thousands labour without good, and one stone for no purpose laid on another."

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* *British India*, vol. 1. p. 430.—The chapter of Mr. Mill, on the Arts of Hindostan, is particularly interesting, and contains a vast variety of curious matter, tending to show that the facts usually adduced as proofs of the early and complete state of civilisation amongst the Carnatic nations, do not establish the position contended for, and that Hindostan had not in fact made any greater progress in the arts than China, Mexico, or other nations still considered in a state of semi-barbarism.

In considering the history and progress of art, its real importance to the happiness of mankind is a question which naturally occurs. If it be true that what are termed the fine arts are of the importance sometimes ascribed to them, their effects on the welfare of mankind may be expected to increase in proportion as they advanced towards perfection; and it is the opinion of some eminent writers, that they have not yet reached the utmost verge of excellence, and that we have still much to hope and to attain. To determine, however, this point, we must have some standard admitted to be just, some uncontroverted principles or axioms with which we can institute comparison, or by which we can measure our progress: taste is too indefinite for the purpose; it is claimed equally by persons who hold the most discordant opinions on the point, and whose repugnant pretensions rest upon the most opposite principles. Being incapable of transmission by very accurate rules of description, in practice taste frequently appears a term convertible with that of fancy.

Whatever doubts may exist as to the importance of the fine arts, the case is different with the sciences. In them, scarcely a discovery or an improvement is suggested but it becomes converted to the use of mankind: they leave no room for conjecture as to their merits, nor any hesitation as to their advance. The navigator, manufacturer, statesman, and philosopher concur in their opinions of their progress and effect; and our ameliorated condition affords the best testimony of their improvement. Whatever may be the comparative importance of the results flowing from these different branches of our knowledge, it is plain that they require at least the same general circumstances to favour their growth—exemption from the desolation of war, opulence to furnish rewards, and leisure to permit application: but, above all, a government should exist, in which the preponderating influence of the people forbids that a nation should be subject to the narrow views and interests which, with few exceptions, appear at all periods to have regulated the dominion of despotism. The suspicion natural to tyranny, and the dread that light or information should expose its deformity, makes it feelingly alive to the dangers resulting from all freedom of inquiry.

It is impossible, nevertheless, to consider the unrivalled excellence which the arts attained during the prosperity of some of the Italian republics, without being convinced of the prodigious effects sometimes produced on the energies of the human mind, by an exemption not merely from the restraint of absolute authority, but even from the languor and tameness often produced by very regular governments, though in effect calculated for the tranquillity and comfort of a people. The internal condition of these states was a perpetual struggle of faction amongst the citizens, a contest for power and popularity amongst the rich, a defective administration of the laws, and a doubtful state of private morals. The same observations may, in a great measure, be applied to some of the ancient Greek republics;—and yet amidst such scenes were reared the most finished monuments of art, precious indeed, but purchased at far too high a price, if the alternations of anarchy and misrule were necessary for their production.

Architecture, as an ornamental science, may be supposed to have kept pace with the art of design, the improvements in each depending nearly on the same vigour of imagination and general refinement of taste; and the same powerful cause, or combination of causes, which (in Greece) so early produced by the operations of genius such a magical effect on the arts of design, exerted a similar influence on the state of architecture.*

Grecian Architecture.

From the contemplation of the solemn grandeur of the Egyptian monuments we proceed to the Greek temples, whose character is so different. Whilst struck with the size of the Egyptian buildings, we feel that they are the effect of incessant labour, the works of slaves, without much of the assistance of intellectual greatness, and that their importance arises chiefly from their extent. It is far otherwise with the works of Greece, where every line is expressive of the genius and imagination of the author; and, though great labour must have been exerted in their construction, yet the mind is relieved from all sense of pain by admiration of the result.

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* *Introduct. to Trans. of Vitruvius.*

The Greeks being more lively in their manners than the Egyptians, and fonder of external show and processions, their temples exhibited a corresponding change; the front was adorned with a peristyle, sometimes double and even triple, as is seen in some of the remains in Sicily, Italy, Syria, &c.

The most perfect simplicity of form was united with the grandeur produced by the rows of columns: a low pediment crowned the façade for the purpose of receiving the slanting concealed roof; and the buildings were large and grand without partaking of the colossal appearance of the Egyptian. The interiors were unadorned, although at times some of the choicest specimens of sculpture were enshrined in them.

The simple grandeur of the Doric, bold without heaviness, rich without being overloaded with ornament, recording in its metopes all the eloquence of sculpture, and typical at once of the artless manners and bold deeds of the Greeks, was preferred by them during the best ages, to the Ionic and Corinthian, in all their great edifices. The Doric also had the peculiar advantage of being equally adapted to great and small edifices; to small, by the simplicity of the divisions and members; to large, by its bold proportions and the massiveness of the entablature.

The Romans followed the Greeks in the form of their temples, but added to their richness by the new and elegant orders with which they decorated them; they frequently substituted a stylobate (pedestal) in place of the steps which supported the Doric columns forming a continuous base, and preferred to this chaste and simple order the elegant and more refined Ionic and Corinthian; and even these they enriched to profusion, lengthening the pediment, and surrounding it by triumphal cars and statues of terra cotta and gilt bronze. The buildings themselves they surrounded by enclosures and colonnades.

The Orders of Architecture ana Proportion.

The origin of the orders of architecture is a subject which has given rise to much fruitless and absurd discussion. Every member of the different orders, every part of the columns and the entablatures, has a variety of origins assigned to it, and each supported by a variety of advocates. One idea which seems to have been very stoutly maintained, is the analogy between the proportions of the human figure and those of the orders; and so far is this idea carried by Michael Angelo, that he declares a knowledge of anatomy to be indispensable to an architect, who without it must be necessarily ignorant of his profession. It is certain, he observes, that the members of architecture have a reference to those of the human body; and he who does not understand the human figure, and particularly anatomy, can know nothing of the subject.

The intrinsic beauty of the Grecian orders has long been one of the dogmas of the connoisseurs. This has been, we think, completely exposed by Mr. Alison in his *Essay on Taste.* The true cause of this beauty may be reduced *to the propriety or fitness of the building for the end designed*, and nothing further: as, in plain buildings, and without any view to ornament, if the walls are of such a height as with our previous experience seems sufficient for their own stability, and for the support of the weight which is imposed on them, we consider the house to be rightly proportioned; whilst if the walls are so large as to appear insecure, or the roof so high as to seem too heavy for its support, the notion of ill proportion immediately occurs. This fitness, however, cannot be accurately measured, and, accordingly, no proportions are defined, and the general conclusions we have formed are our only guides.

But in what are termed the *Orders* of Architecture this is otherwise, and the proportions have been absolutely determined. They are five: the Tuscan, Doric, Ionic, Corinthian, and Composite. The first and last, however, are generally rejected. In considering the orders, it must be remembered, that the *proportion*, not the *ornament*, constitutes the order. Every order consists of three great divisions: the base, the column, and the entablature, or that part which is placed immediately above the capital of the column; and the governing proportions relate to this division, the whole in fact composing a wall, or what in common buildings would be the wall. Though the wall derives its proportion in an order, from the intention of supporting the roof, yet it is complete without the roof; and when there is one, it is generally so contrived as not to appear: the weight which is, or appears to be supported, being the entablature: the fitness, therefore, here, consists in its appearing adequate to the support of the entablature:—"and the appearance of these proportions," observes Mr. Alison, "seems to lead us to this conclusion. Thus in the Tuscan, where the entablature is heavier than in the rest, the column and base are proportionably stronger; while in the Corinthian, where the entablature is lightest, the column and base are proportionably slighter: this position is confirmed by the general use of the term *proportion* in its general acceptation, which implies *fitness to the end designed*: heaviness and slightness are the terms more generally used to express a deviation on either side from the proper relation; both obviously including the consideration of support, and expressing the want of proportion. If our perception of the beauty of proportion were in such cases altogether independent of any such considerations, these circumstances in language could not possibly take place; and it would be as possible to explain the nature and beauty of proportion by terms expressive of sound or colour, as by terms expressive of fitness or propriety.

"That there is no absolute beauty in the proportions of the orders, independent of that arising from fitness, is obvious. Mankind, however, soon acquire ideas of bulk and support; and the feelings of persons in general, on viewing the proportions of an order, are to be considered rather as satisfaction than delight: that which creates the delight, is the magnificence, the grandeur, and the costliness, which such buildings usually display. This is well illustrated by conceiving the entablature as the weight to be supported; and, of course, a certain form and size in the column is demanded for this; and in the base, for the support of both. A plain stone, for instance, set upon its end, has no proportion further than for the purpose of stability; if it appears firm, it has all the proportions we desire, and its form may be varied in a thousand ways, without interfering with our sense of its proportion. Place a column, or any other weight, on this stone, immediately another proportion is demanded, namely, that which is the proportion adapted to support this weight; though the form supported has no proportion further than that which is necessary for its stability, or for continuing in its situation. Above this, again, place an additional body, and immediately the intermediate one demands a new proportion; *viz.* a proportion suited to the weight it supports; and the first part, or the base, demands also another proportion in consideration of the additional weight which is thus imposed upon it. On this supposition, it is obvious that the consideration of fitness alone leads us to expect a certain proportion in each of these parts, and the parts are pleasing or beautiful just as they answer this demand."

Mr. Alison, however, admits, that the mere consideration of fitness is insufficient to account for the pleasure so universally derived from the established orders, which have been so long adhered to without any attempt at deviation. This is justly to be attributed to other feelings unconnected with proportion, arising from the ornaments, the materials, and the size; and more particularly from the associations which arise on a contemplation of the *Grecian* orders; although we are inclined to attribute our admiration to the style of the architecture alone.

One of the objections which may be urged against these positions, is the fact, that notwithstanding there is no intrinsic beauty in the proportions of the orders, yet they have, for a long period, been adopted without any attempt at alteration, which would seem to indicate that they were intrinsically beautiful. But the feelings and motives which would in most other objects of art lead to a variation, do not exist with respect to architecture. Of all the fine arts, architecture is the most costly; and the wealth even of nations is equal only to slow and infrequent productions. The value of such objects is therefore, in a great measure, independent of fashion; the invention of men is little exerted to give an additional value to subjects, which in themselves are valuable; and the art itself, after having arrived at a certain necessary degree of perfection, remains in a great measure stationary, both from the infrequency of cases in which invention can be employed, and the little demand there is for its exercise.

In addition to the costliness of the production, we must consider its durability; since it is only those productions of which the materials are perishable, and require often to be renewed, that are subjected to the influence of variety. The works of architecture are designed to last, and do last for centuries: the life of man is of far less duration than such productions; and the present period of the world, though old with respect to those arts which are employed upon perishable subjects, may be considered as yet young in relation to an art which is employed upon such durable materials as those of architecture. Centuries must elapse before works of this class demand to be renewed. The sacredness of antiquity is acquired in the mean time, and a new motive given for the preservation of similar forms.—We have considered Mr. Alison's positions so true, and so important to the due consideration of the subject of the orders, that it has been necessary to give them at length.

In observing on the nature and effect of Grecian architecture, it is necessary to advert to a singular position of the learned writer of the Introduction to the translation, of Vitruvius, (Lord Aberdeen,) namely, that the ancients never possessed any knowledge or perception of those qualities of external objects which are called picturesque. The admirable positions of the Temple of Minerva, the approach (on the angle) to the Temple of Jupiter Olympius at Athens and Sunium, and many other examples, may, we think, be quoted as ample testimony that the ancients possessed a fine and just sentiment for the picturesque position and effect of these monuments, although they practised landscape painting very little, and the illusion of perspective was not much used by them in their compositions. The villa of Pliny, so elegant and so interesting in the description, and which has been considered as a proof of the opinion we have advanced, is viewed by the writer above noticed as not in truth affording any grounds for such an opinion: and he suggests, that if any external irregularity may be considered to have existed, it must have been purely accidental, and only produced in consequence of the necessary arrangement of the interior apartments, and without the least reference to any general or preconceived design.

With regard, however, to the private houses of the ancients in cities, there are but very few instances of much attention being paid to the exterior architectural design; and they were of slight construction. Those of Pompeii, as well as those designed in the various paintings found on the walls of that city, seem to prove that exterior architecture was not an object, and was generally sacrificed to that of the interior. The habits of domestic privacy of a people which required that the apartments should receive light and air only from an interior court or atrium, and the climate which made such a court desirable on account of its coolness, induced them to lavish the graces and expense of their architecture on the interior rather than the exterior of their houses. Julius Cæsar obtained a special decree to enable him to adorn the front of his house with a pediment: and Gibbon observes, that in the commonwealths of Athens and Rome the modes and simplicity of private houses announced the equal condition of freemen, whilst the sovereignty of the people was represented in the majestic edifices designed to the public use; every part of the empire was fitted with ample theatres, temples, porticoes, triumphal arches, baths, and aqueducts, all variously conducive to the health, the devotion, and the pleasures of the meanest subject.

Gothic Architecture.

In the foregoing observations on the different styles, the Gothic has been omitted. Whatever may be its beauties, and whatever may be the feelings of admiration arising from association, there can be no question that the style is but little adapted to utility; and the expense of producing what might be considered as perfect specimens of this branch of the art, would alone in these days, in a great degree, preclude its revival. The style termed Gothic, (concerning the origin of which we shall not add to the number of discussions,) probably took its rise in the East; this hypothesis has been the most successfully supported by the fact of its appearing nearly at once throughout Christendom, and at a time when all the different states of Europe were attracted to the East by the Crusades; and it seems that the Goths had no share in the invention of the style which now bears their name, it being, in fact, a term of vituperation used by those who had introduced the restored Grecian. In Italy the term had its origin with the school of Palladio, and in England with Inigo Jones and Wren.*

Roman Architecture.

The zenith of Roman architecture was under the auspices of Vespasian and his immediate successors, who completed the Temple of Peace and the Coliseum: upon the establishment of Christianity, external magnificence was sacrificed to internal decoration; and the oblong square, the ground plan peculiar to ancient temples, simple in the interior but magnificent in the external view, was gradually changed, as will be hereafter noticed, into the Greek and Latin cross, which are less favourable to beauty.

It was not, however, till about the time of Leo X. that architects were encouraged to apply to the antique models, and to measure their proportions, that the orders might be designed with precision. With Bramante, Sangallo, and Michael Angelo, the elegance of the Grecian and the splendour of the Roman architecture was revived, and St. Peter's was commenced. This may be considered as the period of the revival of architecture in Europe. After that, Rome became the grand school for architects; and they in general were content to form their taste, not as the great authors of the revival had, from works of antiquity, but from the new works which were then rising. It was not, however, till the time of Palladio that all the elegance and simplicity of the ancient buildings were rendered applicable to the practical purposes of domestic use.

The different Epochs.

On reviewing the progress of architecture, we find it marked by distinct epochs, which will, perhaps, admit of the following distribution. The *Assyrian*, of which, however, we have no definite knowledge, except its mention in scripture.—The *Egyptian* almost coeval with the Syrian, in which, however, a distinct style was adopted, marked by the building of Thebes, Dendyra, and the other principal monuments of Egypt.—The *Grecian*, (about the 7th to the 3rd century before Christ,) when the principal temples, including the Parthenon, the temples of Pæstum, Ægina, Corinth, &c. were constructed. — The *Roman*, in which the great aqueducts, bridges, and other public works were built, and in which the arch was brought into more efficient use, and gave rise to novel and infinite combinations and improvements in the art of building: the time of Hadrian may be fixed as the best period of this style.—The *first Christian* era, (Justinian,) in which the multiplied dome or cupola first came into general use; and this is important, as it was adopted for two reasons—to accommodate the large Christian congregations, and to distinguish their churches from the heathen temples, which the Iconoclasts held in detestation. — The *Saracenic*, which, without the colossal materials and mechanical means used by the Romans, first gave the idea of raising immense structures by smaller means. — And lastly, the *Cathedral* or second *Christian era* (thirteenth century) is remarkable for the vast sacred edifices which were erected throughout Europe, all partaking of the same general character.

It was during these several eras that the different great improvements were effected. As, in the *Assyrian*, the invention and completion of the brick.—In the *Egyptian*, the working of granite and marbles, and the use of them on an extended scale.—In the *Grecian*, the perfection of the beauty of proportion or fitness supplying the place of vastness and ponderous mass.—In the *Roman*, the arch, forming in fact the basis of the science, and admitting of the extension and adaptation of the principles of architecture to works which the Greeks could not have executed.—In the *first Christian* era, the dome perfected.—And in the *second* or *Gothic*, the pointed arch introduced, by which additional lightness and strength were attained.—These eras were dependent on the great religious changes in the history of Europe; were respectively marked by a different manner of construction; and (though separated by considerable intervals) formed the types for the productions during the intermediate periods.

Of Architecture in England

The first appearance of the Italian school in England began with Holbein, (Hen. 8.) who was established here under royal patronage, and gained sufficient influence for a partial introduction of the architecture which had begun to revive in Italy. The first house purely Italian is stated, by Mr. Dallaway, to have been built by Sir Horatio Palavicini; and although many magnificent houses were built in the reign of Elizabeth, they had lost all the beauty of the Gothic, without deriving any improvement from the dawning taste for the revived style. The ornaments, both within and without, were cumbrous, and equally void of grace and propriety:—nothing could exceed the heaviness of the cornices and ceilings wrought into compartments, or the awkward intersection of the passages; the hall retained nothing of the Gothic character, excepting its size and large bay window, and instead of battlements and pinnacles, the parapet was broken into numerous high misshapen pediments. Towards the end of the reign of James I. and the beginning of Charles's taste in architecture made a bold step from Italy to England at once, scarcely resting a moment to visit France by the way.

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* This observation does not of course apply to the Saxon or Norman style with the circular instead of the pointed style, which was probably borrowed from the Roman and Byzantine schools, and hence not improperly termed *Romanesque.*

From the most profound ignorance in architecture, Inigo Jones (who had been sent to Italy either by Lord Pembroke or Lord Arundel) started up a prodigy of art, vying in some degree with his master, Palladio. The Banqueting-house at Whitehall, and the Church of St. Paul, Covent Garden, are sufficient proofs of his claim to be considered the founder of this style in England. But the civil wars put a stop to the course so happily begun. Wren, the next genius, arose to kindle afresh the love for that art which had been so long neglected. What had been begun by Jones was fully accomplished by Wren; and the period of our greatest architectural eminence was not far distant.

CHAPTER II.

Wren's Birth, Education, and early Studies.

CHRISTOPHER WREN was born at East Knoyle, in Wiltshire, the rectory of his father, Dr. Christopher Wren, Dean of Windsor, on the 20th day of October, 1632. His father was a learned divine, descended from an ancient English family of Danish origin, and his mother was the daughter and heiress of Robert Cox, of Fonthill, in the county of Wilts.

Dr. Matthew Wren, his uncle, successively Bishop of Hereford, Norwich, and Ely, was a person eminent in the ecclesiastical history of England; who, having devoted himself to the royal cause, was impeached by order of the House of Commons in 1641, shortly after the impeachment of Archbishop Laud; but he was never brought to trial, though he suffered a protracted imprisonment of nearly twenty years: an injustice not singular in those troublous times. The *Parentalia*, a work we shall afterwards notice, contains a somewhat laboured defence of the bishop, meant to have been used had he been put on his trial. Right or wrong, he adhered firmly and unchangingly to the cause he had espoused, and to the memory of his royal master; and Cromwell, who often met Christopher (the subject of this memoir,) at his son-in-law Claypole's sent a message to the uncle, (by the nephew,) that he might come out of the Tower if he pleased; but the bishop utterly refused, disdaining the terms proposed for his enlargement; which were, as he conceived, a mean acknowledgment of Cromwell's favour and submission to his tyranny; determining, as he expresses it, to tarry the Lord's leisure, and owe his deliverance to him only. Whether Cromwell was informed of the terms with which his offers were rejected, is not known; but if he was, it does not appear to have altered for the worse the situation of the martyr to the cause of Royalty. The bishop, however, was mainly tinctured with the feelings of the times: he was conspicuous for his cruel persecution of the dissenters within his diocese; and he is represented as proceeding passionately against the Walloon manufacturers, who in the time of Edward VI. transplanted themselves into England and had their privileges enlarged, and were much encouraged by Elizabeth. He also makes a conspicuous figure in the virulent party squib, called "A nest of perfidious vipers in the parliament of black saints." From this it may be inferred, that his zeal for his own party carried him beyond reason, and exposed him to the severe animadversions of his enemies.—He had four sons, all of whom were eminent in their day; one being, at the Restoration, Secretary to Lord Clarendon, and afterwards to James, Duke of York; one was knighted, and the other two returned to Parliament.

Dr. Wren, the father of Sir Christopher, was educated at Merchant Tailors' School; he became a fellow of St. John's, Oxford, Chaplain in Ordinary to Charles I., and was ultimately installed Dean of Windsor, and made Registrar of the Order of the Garter. His tastes and his habits led him to associate with all the learned of the age; and he possessed himself considerable attainments both in science and literature: he had turned his attention to the cultivation of that art, in the pursuit of which his son was afterwards to become so eminent; and it appears, from an estimate made by him, and preserved in the State Papers, that he had been employed by the court respecting a building to be erected for the Queen of Charles I.

Wren was one of those whose future eminence was early foreseen; and whose riper years redeemed the promise of youth. Like his great contemporary Pascal, his genius early displayed itself. But though alike in talents, their fates were dissimilar. The genius and acquirements of Wren laid the groundwork of his happiness through a long series of years, whilst in Pascal the acuteness of his intellect, and his acquirements, seem but to have aggravated his misery, and to have hurried him to an early grave. At the age of thirteen an invention by Wren of some new astronomical instrument is recorded, the account of which is dedicated by him to his father, in a Latin epistle. This essay was followed by others of the same kind. His infancy and youth were marked by a peculiarly delicate state of health; he received his early education at home under his father, and at the age of fourteen was sent to Wadham college, Oxford, where notwithstanding his youth, his attainments procured him the friendship and patronage of the most eminent persons, amongst whom were the ingenious Bishop Wilkins, and the celebrated Oughtred, who in the preface to his *Clavis Mathematica* mentions Wren as having attained, at the age of sixteen, such a knowledge in mathematics and other branches of natural philosophy, as gave promise of future eminence.—Wilkins also introduced him to Prince Charles, Elector Palatine, as a prodigy.

As early as the year 1645, Dr. Willis, an eminent mathematician, formed a sort of club of scientific persons, chiefly those connected with Gresham college, who met weekly; amongst them was Wren. Their object was the discussion of all subjects relating to philosophica inquiries, and from these meetings originated that body of eminent persons called the Royal Society, who by their pursuits contributed so mainly to the advancement of science. In 1648, Dr. Wilkins and several other leading members retired to Oxford, where they continued their weekly meetings, and thus set a fashion for the study of the useful sciences in that university. Amongst those distinguished persons were Sir W. Petty, the ancestor of the Lansdowne family, and Robert Boyle.

One of Wren's early inventions in the arts was a sort of *penna duplex*, for which he obtained a patent, and which gave rise to some controversy between Sir William Petty and himself; the former having taken out a patent for a similar invention on his return from France in the same year. Wren, more fortunate than his father and uncle, though he lived in troubled times, when the conflicting parties were exhausting themselves in acts of violence, pursued his course straight to the object of his ambition, in the study of those sciences which he was afterwards to adorn.

He is said to have been the first who turned his attention to the representation of subjects as shown in a microscope, and in which he was mainly assisted by Hooke; and Harrington, the author of the *Oceana*, alludes to these tastes, and also to the politics of the family, in some observations on a cousin of Wren's, whom he designates as being one of those *virtuosi*, "who had an excellent faculty for magnifying a louse and diminishing a commonwealth." Shortly after this he produced a Theory of the Planet Saturn, an Algebraic Treatise on the Julian Period, a tract much esteemed, it is said, by the most learned mathematicians of his day. In 1653 he was elected Fellow of his college, and soon proceeded to London, continuing to cultivate the sciences. One of the most important inventions of this period was the barometer; and to this some laid claim on behalf of Wren; but the discovery was, without doubt, the property of Torricelli, though it is supposed Wren was the first in England who suggested that the various weight of the atmosphere was the true cause of the variations in the height of the mercury, which the followers of Des Cartes had ascribed to the influence of the moon. Evelyn (himself a man of sense and an ardent lover of learning, who studied all that was useful to his country, and was associated with the most eminent of his time) could not but often come in contact with Wren; and accordingly, in his amusing journal, he frequently bears testimony to his early excellence, calling him "that prodigious young scholar," "that miracle of youth," "rare and early prodigy of science."

Whilst Wren was devoted to the pursuits of science, the times were distracted by the fury of party. The objects of the early association of eminent persons at Oxford is thus described by Spratt, Bishop of Rochester, in his *History of the Royal Society* "Their first purpose was no more than only the satisfaction of breathing a fresher air, and of conversing in quiet one with another, without being engaged in the passions and madness of that dismal age. And from the institution of that assembly it had been enough, if no other advantage had come but this, that by this means there was a race of young men provided against the next age, whose minds, receiving from them their first impressions of sober and generous knowledge, were invincibly armed against all the enchantments of enthusiasm. But what is more, I may venture to affirm, that it was in good measure by the influence which these gentlemen had over the rest, that the university itself, or at least any part of its discipline and order, was saved from ruin.

"Nor were the good effects of this conversation only confined to Oxford, but they have made themselves known by their printed works, both in our own and in the learned languages, which have much conduced to the fame of our nation *abroad*, and to the spreading profitable light at *home*."

It was not until the age of Wren that the inductive process of Bacon was duly understood and appreciated. This period, on the eve of Newton's great discoveries, was perhaps the most important that has yet occurred in the annals of science. The spirit of inquiry, at first feeble, which actuated some individuals at the time of the revival of learning, had from numerous causes gathered strength, and spread itself over Europe. Bacon had turned his powerful and creative mind to the state of human knowledge, marking its imperfections and planning its improvements, amending the vagueness and uncertainty of physical speculations, and supplying the want of connection between the sciences and the arts. This and the illustration of Bacon's method by Galileo and his contemporaries, (amongst whom Wren was eminent,) first led the way to the general adoption of the new philosophy—reasoning gradually from particulars to those that were only one step more general; not as formerly, adopting general positions drawn suddenly from particular instances hastily assumed. It was now felt that facts and not opinions were the things to reason about, in order to arrive at the knowledge of the laws governing the material world; and Bacon himself had foreseen the formation of a society directed to scientific improvement, and has given a general outline of it in the *Nova Atlantis*. And it was now that the enthusiastic ardour in the pursuit of natural philosophy was awakened in the minds of literary men, and which has ever since remained undiminished. None of the members of these meetings were more conspicuous than Wren, who, together with Boyle, (the great improver of the air-pump,) had imbibed the true spirit of Bacon. They applied themselves to the prosecution of experimental science, being the avowed enemies of the philosophy of Aristotle; following up the true principles of the new philosophy by preparing a history of the phenomena of nature in all their modifications and varieties; and instituting every form of experiment for the sake of discovery. Wren was one of the first (in conjunction with Wallis, Huygens, Newton, Leibnitz, and the Bernouillis) to occupy himself with the investigation of the cycloid, which had been discovered by Pascal; and he constantly urged, in his communications to the Royal Society, the importance of experiments and observations on facts. "For the improvement of theories," he observes, "we need be least solicitous; it is a work which will insensibly grow on us if we be always doing something in experiment; and every one is more prone to exercise his fancy in building paper theories than patient first to pile the unsure foundation, and hew solid materials out of the history of nature: this is rather our task, and in many things we must be content to plant crab stocks for posterity to graft on; and instead of the vanity of prognostieating, I could wish we would have the patience for some years of registering past times, which is the certain way of learning to prognosticate; experiment and reason is the only way of prophesying natural events; in combating prejudices, detecting error, and establishing truth."

This great era in the progress of useful knowledge was destined to conclude with the most splendid series of philosophical improvements yet recorded—the discovery by Newton, in succession, of fluxions, the composition of light, and the principle of universal gravitation, all within twenty years, and all the work of one individual!

During his residence at Oxford, Wren in anatomical science stood amongst the first professors of his day, and as early as the age of fifteen he was employed by Sir Charles Scarborough, an eminent physician and mathematician, as a demonstrating assistant. His abilities as a demonstrator, and his attainments in anatomy generally, are acknowledged by Dr. Willis, in his Treatise on the Brain, for which he made all the drawings; and he is allowed to have been the originator of the physiological experiment of injecting various liquors into the veins of living animals, which Bishop Spratt calls a "noble experiment," exhibited at the meetings at Oxford. A notice of it was sent into Germany, and published abroad, as is supposed by the treachery of Oldenburgh, a person connected with the men of science of that day; and who is believed often to have secretly communicated to the continental philosophers the discoveries which came to his knowledge, thus giving rise to numberless disputes and claims to priority of invention among the learned of that time.

This experiment is alluded to by Sir Christopher Wren himself, in a letter to a friend in Ireland, (conceived by Mr. Elmes to be Sir William Petty:) "The most considerable experiment I have made of late is this: I injected wine and ale into the mass of blood in a living dog, by a vein, in good quantities, till he became extremely drunk; but soon after voided it by urine. It will be too long to tell you the effects of opium, scammony, and other things which I have tried in this way. I am in further pursuit of the experiment, which I take to be of great concernment, and what will give great light to the theory and practice of physic." The French, however, laid claim to the discovery; but we shall not here enter into the controversy; the genius and the acknowledged and undisputed works of Wren enable him beyond all others to abandon his claim when it is contested.

CHAPTER III.

Wren's pursuits to the Building of St. Paul's.

WREN, in his twenty-fifth year, left his retirement at Oxford for the more extended field of the metropolis; being chosen, in 1657, to fill the Professor's chair of Astronomy at Gresham college. His inaugural Oration in Latin is published in Ward's *Lives of the Gresham Professors*, and its first sketch in English is to be found in the *Parentalia;* it is curious, as showing the care and labour which he thought it necessary to bestow on the work. This Oration at once established his reputation, and his Lectures were attended by the most eminent and learned persons of the time. The greater part of the Oxford Society, who afterwards were the leading members of the Royal Society, coming to London about 1658, usually assembled to hear Wren's Wednesday Lectures, in his Lecture room, and on Tuesday those upon, Geometry, by Rooke.

In his inaugural discourse, amongst other things, he proposed several methods by which to account for the shadows returning backwards ten degrees on the dial of King Ahaz, by the laws of nature. One subject of discussion was the Telescope, to the improvement of which he had greatly contributed. Another head comprised certain properties of the air and the barometer.

In 1658 Wren acquired fresh fame as a mathematician, by the solution of the celebrated problem of Pascal; which had been given out, under the assumed name of Jean de Mountfort, as a challenge to the learned of England; and, in return, he proposed another, for the solution of the mathematicians of France, which had formerly been proposed by Kepler, and solved by himself geometrically. The challenge, however, was never answered. In the same year he communicated four mathematical tracts to Dr. Wallis, the Savilian Professor at Oxford, which were published by the doctor in his Treatise on the Cycloid.

His method for the rectification of the cycloid was also produced by him this year; and he made a series of observations on the phases of the Planet Saturn, the results of which he disclosed in his Gresham Lectures.

His pursuits were alien to the fury of party or the politics of the day, and to this, and his connection with Claypole, it is probable he owed his escape from that persecution to which the other members of his family were exposed. The members of the Club, on the death of Cromwell, were scattered by the distractions which ensued, and the College itself became a quarter for soldiers.

Wren, who had fled from London to Oxford during the confusion, received the following letters from the Bishop of Rochester and his cousin; and as they are curious we shall give them at length.

Dear Sir,

This day I went to visit Gresham College, but found the place in such a nasty condition, so defiled, and the smell so infernal, that if you should come now to make use of your tube, it would be like Dives looking out of hell into heaven. Dr. Goddard, of all your colleagues, keeps possession, which he could never be able to do, had he not before prepared his nose for camp perfumes, by his voyage into Scotland, and had he not such excellent restoratives in his cellars. The soldiers by the violence which they put on the Muses' seats, have made themselves odious to all the ingenious world; and if we pass by their having undone the nation, this crime we shall never be able to forgive them; and as for what concerns you, they have now proved, that their pretensions to religion were all feigned, since by hindering your Lectures they have committed so manifest a sin against Heaven. Yet your many friends here hope you will hereafter recompense this unhappy leisure which is afforded you, by making those admirable discourses which you had intended for this place more public; and that you will imitate Cicero, who, being hindered pronouncing his Oration *pro Milone*, by the guards of Pompey's soldiers that encompassed his chair, set it forth afterwards more perfect than the rest.

His cousin Matthew, eldest son of Matthew, Bishop of Ely, also wrote to him from London at the same time, and on the same account, the following letter, which admirably depicts his own feelings and the state of the capital.

Dear Cousin,

Yesterday being the first of the term, I resolved to make an experiment, whether Dr. Horton entertained the new auditory of Gresham with any Lecture; for I took it for granted, that if his divinity could be spared, your mathematics would not be expected. But at the gate I was stopped by a man with a gun, who told me there was no admission on that account, the college being reformed into a garrison. Then, changing my pretension, I scarce got permission to go into Dr. Goddard, who gave me assurance enough, that none of your colleagues intended to appear this term, unless the soldiers be removed, of which there is no probability. Upon these premises, it is the conclusion of all your friends, that you may save that journey hither, unless some other occasion calls you; and for these I expect you will make me your agent, if they be such as I am capable of despatching. But it will not be amiss to take from hence the occasion of a short and civil letter to the Committee, signifying that you hope you have not deceived their expectations in choosing you, and that you are ready to attend to your duty but for this public interruption and exclusion from your chamber; or what else you will that looks towards this. I know no more domestic news, than what every body talks of. Yesterday I was in Westminster-Hall, and saw only Kendigate and Windham in the two courts, and Wild and Parker in the Exchequer: in the chancery none at all: for Bradshaw keeps the Seal as if it were to be carried before him in the other world, whither he is going. Glyn and Fountain pleaded at the bar. They talk much of the mediation of the two crowns, and proceed so far as to name Marshall Clerambault for the Ambassador, who is come hither from France.—My service to all my friends.

Soon after the return of Charles II., Wren was chosen to fill the Savilian professor's chair at Oxford, then one of the highest distinctions which could be conferred on a scientific person. The Restoration, which began with such favourable auspices, was mainly conducive to the foundation of the Royal Society, in which Cowley, the poet, bore a principal part; planning a society, which should have the disposal of considerable funds, for the encouragement of knowledge, and not forgetting the important work of the instruction of youth. The object of the society cannot be better expressed than in the words of Spratt, its earliest and eloquent historian.

"The purpose of its founders was to make faithful records of all the works of nature and art which can come within their reach; so that the present age and posterity may be able to put a mark on the errors which have been strengthened by long prescription; to restore the truths that have lain neglected; to push on those that are already known to more various uses; to make the way more passable to what remains unrevealed. This is the compass of their design. And to accomplish this, they have endeavoured to separate the knowledge of nature from the colours of rhetoric, the devices of fancy, or the delightful deceit of fables. They have laboured," continues this learned prelate, "to enlarge it, from being confined to the custody of a few, or from servitude to private interests. They have striven to preserve it from being overpressed by a confused heap of vain and useless particulars; or from being straitened and bounded up too much by general doctrines. They have tried to put it into a condition of perpetually increasing, by settling an inviolable correspondence between the hand and the brain. They have studied to make it not only an enterprise of one season, or of some lucky opportunity; but a business of time, a steady, a lasting, a popular, an uninterrupted work. They have attempted to free it from the artifice and humour and passions of sects; to render it an instrument whereby mankind may obtain a dominion of things, and not only over one another's judgments. And, lastly, they have begun to establish these reformations in philosophy, not so much by any solemnity of laws, or ostentation of ceremonies, as by *solid practice and examples*; not a glorious pomp of words, but by the silent, effectual, and unanswerable arguments of real productions. As for what belongs to the members themselves that are to constitute the society, it is to be noted, that they have freely admitted men of different religions, countries, and professions of life. This they were obliged to do, or else they would come far short of the largeness of their own declarations. For they openly profess, not to lay the foundation of an English, Scotch, Irish, Popish, or Protestant philosophy, but a *philosophy of mankind*."

We have been thus minute in setting forth the origin of the Royal Society, as being one of the most important institutions of the country, founded on the purest and the best principles for the attainment of its great object.

It may be permitted here to remark, that this society (so long eminent in Europe) has, in a great measure, become more aristocratic than formerly in the selection of its members; for, in Charles's time, on an intelligent citizen of London being proposed at the recommendation of the king, he told them, *if they found any more such tradesmen they should be sure to admit them all*

Wren about this time discovered a method for the calculation of solar eclipses, which was published by Flamstead in his doctrine of the sphere, and which was followed for many years as the most concise and plain. The Annals of the Royal Society also bear the amplest testimony to his knowledge and industry, in his commentaries on almost every subject connected with the abstruse sciences and the arts of life; and, in conjunction with Boyle, Hooke, and Wilkins, he originated many of the most important experiments of the day.

Amongst his communications was a History of the Seasons, as to temperature, weather, productions, diseases. For illustrating this subject he devised many curious machines, several of which kept their own registers, tracing out the lines of variation so that a person might know what changes the weather had undergone during his absence; and these contrivances he applied to wind-gages, thermometers, barometers, hygrometers.

He made great additions to the recent discoveries on pendulums; and referred to what has been since perfected, the making the pendulum a natural standard for measure.

He also originated many ways of making astronomical observations easy and accurate; and added much to the theory of dioptrics. He made constant observations on Saturn, and gave a true theory of that planet, before the printed discourse on the subject by Huygens appeared. He made maps of the Pleiades and other stars; and proposed methods to determine the great question as to the earth's motion or rest, by the small stars about the pole, to be seen in large telescopes. And he effected many improvements in the theory of navigation.*

Amongst his discoveries in the arts there appears great ground to suppose, that it was he and not Prince Rupert who first invented the art of engraving in Mezzotinto, though it was subsequently much advanced by the Prince; who did not, however, bear any ill-will towards his rival; for it appears from the *Parentalia*, that Wren was enrolled in the list of his especial friends, to whom that distinguished personage sent a yearly present of his choicest wine, from his vineyard on the Rhine.

He also, from the years 1660 to 1720, employed himself in a series of papers on the longitude. To enter into a detail of all the studies and discoveries of Wren would, in fact, be to give the whole history of natural philosophy in his age. Many of his inventions are lost; for it will be observed, that he himself printed nothing: many were secretly sent abroad, and appropriated by others not unwilling to appear in borrowed feathers. Wren himself observes, in one of his letters, "I must confess I have often had the pusillanimity rather to neglect that right I ought in justice to have vindicated, than, by challenging it too late, incur the jealousy of being a plagiary."

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* Hutton, *Mathemat. Dict.* &c.

Whilst at Oxford he was employed by the king to make drawings of the animalcula seen by a microscope, as we have before noticed; and a model of the lunar globe as seen by the best telescope of the times, was constructed by him, representing the spots and various degrees of whiteness on the moon's surface, with the hills, eminences, and cavities, the whole contrived so that by turning it round to the light it showed all the lunar phases, with the various appearances that arise from the shadows of the mountains and valleys. This was afterwards placed in the king's cabinet.

Nor were the Muses neglected by Wren; his pursuits in this kind are alluded to by his correspondent the Bishop of Rochester, who compliments him on some translations of Horace, observing: "You have admirably well hit his genius, your verse is harmonious, your philosophy very instructive for life, your liberty in translating enough to make it seem to be an English original, and yet not so much but that the mind of the author is still religiously observed." Not much faith is to be given to the encomiums of friends in literary confidences, but from this it may fairly be inferred, that Wren must have at least surpassed mediocrity.

In 1662 his *Prelectiones Astronomicæ* were published at the Oxford press. Dr. Isaac Barrow, who succeeded Rooke as professor of geometry at Gresham College, in his inaugural address, pronounces a very elegant encomium upon the merits of Wren, into which he enters largely; describing him as being one of the earliest promise, and the fullest performance, of any genius of his time.

In 1675, the Bishop of Rochester dedicated to Wren his observations on Mons. de Sorbiere's *Voyage to England;* and Hooke, in the preface to his *Micrographia*, states, that although he was at first induced to undertake the work at the suggestion of Bishop Wilkins, yet he commenced it with reluctance, because he had to follow the footsteps of so eminent a person as Dr. Wren, who was the first that attempted any thing of this nature, and whose original draughts make one of the ornaments of the great collection of rarities in the king's closet; adding, "I must affirm of him, that since the time of Archimedes there scarce ever met in one man so great a perfection, such a mechanical head, and so philosophical a mind."—He is also noticed with great honour by Newton in his *Principia*, in conjunction with Wallis and Huygens, as among the first mathematicians of the age.

Perhaps the whole history of literary and scientific men does not afford an example of one held in more high and general estimation than this highly gifted individual. His contemporaries appear willing and eager to testify both their admiration of his genius, and their esteem for that unreservedness and candour which prevailed throughout his intercourse with his associates. The history of his career is stained by none of those bickerings, those paltry struggles for priority or fame, so frequent in the lives of others of his time, who were as conspicuous for the weakness of their feelings as for the greatness of their minds. None of their bad passions appear ever to have darkened Wren's thoughts, or disturbed the even tenour of his course, directed as it was to the advancement of his favourite art, and the attainment of all that was useful in science. Neither could he be said to be afflicted with the credulity or vain pretensions which marked many of those who lived in the same age.

In 1665 he went to Paris, for the purpose of studying all the principal buildings, and the various inventions in the different branches of mechanics. From thence he intended to pass on into Italy, for the purpose of studying Vitruvius amidst the great remains of antiquity. While at Paris the Louvre was in progress, 1000 hands being daily employed on the works: some in laying its mighty foundations; some in raising the different columns and entablatures, composed of vast stones, by great and useful engines; others in carving, inlaying marbles, plastering, painting, gilding, which altogether formed, in the opinion of Wren, a school of architecture the best at that day in Europe. It was here he saw those great masters of the art, Bernini and Mansard. His few observations on the buildings of France have a peculiar relish and interest. "Fontainbleau (he remarks in one of his letters) has a stately wildness, and vastness, suitable to the desert in which it stands; the antique mass of the

Castle of St. Germain's, and the hanging gardens are delightfully surprising, (I mean to any man of judgment,) for the pleasures below vanish away in the breath that is spent in ascending.—The Palace, or if you please to call it, the Cabinet of Versailles, called me twice to see it; the mixture of brick and stone, blue tile and gold, make it look like a rich livery. Not an inch within but is crowded with little curiosities of ornament. The women, as they make here the language and the fashions, and meddle with politics and philosophy, so they sway also in architecture; works of filigree, and little trinkets, are in great vogue, but building ought certainly to have the attribute of *eternal*, and therefore to be the only thing incapable of new fashions."*

After enumerating many other buildings, he adds, "all of which I have surveyed, and that I might not lose the impression of them I shall bring you almost all France on paper, which I have found by some or other ready designed, and on which I have spent both labour and some money. Bernini's design of the Louvre I would have given my skin for; but the old reserved Italian gave me but a few minutes' view. It was a fine little draught on five pieces of paper, for which he had received as many thousand pistoles. I had only time to copy it out by fancy and memory, and I shall be able, by discourse and a crayon, to give you a tolerable account of it." In one of his letters he notices having on the anvil, "Observations on the present state of architecture, arts, and manufactures in France," which, however, unfortunately were never completed.

Wren returned in the beginning of 1666, and it does not appear that he carried into execution his project of visiting Italy.

Soon after the restoration, Charles II. contemplated the repair of the Cathedral of St. Paul's, which had become dilapidated during the commonwealth; its revenues having been confiscated, and the choir converted into horse barracks by Cromwell. In 1660 a commission was issued (in which Wren was named) to superintend the restoration. He was long employed in considering the best mode of effecting this. The cathedral had been partly repaired by Inigo Jones, by the addition of a beautiful Corinthian portico at the west end, not however in character with the style of the building. Wren proposed to rebuild the steeple with a cupola; a form of Church building, Evelyn observes, not then known in England, but which was of wonderful grace. This project was at once defeated by the desolating fire of 1666, which, destroying the greater part of the city, so injured the cathedral as to make its restoration impossible; and to this the scaffolding, which had been put up for the repairs, mainly contributed.

Evelyn alludes to the attempt to repair St. Paul's, in his dedication to Wren of his *Account of Architects and Architecture.* "I have named St. Paul's, and truly not without admiration as oft as I recall to mind, as I frequently do, the sad and deplorable condition it was in: when, after it had been made a stable for horses, and a den of thieves, you, with other gentlemen and myself were by the late King Charles named to survey the dilapidations, and made report to His Majesty in order to a speedy reparation; you will not, as I am sure, forget the struggle we had with some who were for patching it up any how, so the steeple might stand instead of new building; when, to put an end to the contest, five days after, that dreadful conflagration happened, out of whose ashes this phœnix is arisen, and was by providence designed for you."

That which produced so much individual misery, afforded (as Sir Richard Steele observes) the greatest occasion that ever builder had to render his name immortal, and his person venerable. A whole city at once laid waste was an opportunity for the display of inventive genius, which had never before been given to any architect; but the selfishness of individuals, their disputes, and intrigues, and conflicting interests, prevented Wren from carrying his great design for the restoration of the metropolis into effect. And though many of the narrow lanes and confined spaces of the old city were removed, still none of his views were adopted. As soon as the fire was subdued, whilst the ashes were yet alive, he was on the ground, considering his plan for the restoration of the city. He proposed one main street from Aldgate to Temple Bar, in the middle of which was to have been a large square capable of containing the new church of St. Paul, with a proper distance for the view all round; the parish churches were to be rebuilt so as to be seen at the end of every vista of houses, and dispersed at sufficient distances from each other; four piazzas were designed at proper distances; and lastly, the houses were to be uniform, surrounded by arcades, like those in Covent Garden; while by the waterside a large quay was to run, along which were to be ranged the halls belonging to the several companies, with warehouses and other appropriate mercantile buildings. If such a plan (modified in some degree) had been effected, London, it must be confessed, would have far exceeded every capital in the world. It may, however, be doubted, whether the climate of this country is suited to covered arcades; and with respect to the complete regularity and uniformity of the streets, although in theory this is captivating, in execution its effect is dull and disappointing. The total want of interest and variety in those towns where it has been adopted, such as Carlsrhue, Darmstadt, and Manheim, to which we may add the New Town of Edinburgh, affords sufficient evidence in support of this position.

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* Never, perhaps, was so complete a failure as the mass of incongruities at Versailles, and never such a profuse squandering of treasure and even of life. Dulaure, in his "History of Paris," states the expenses (including the moving of hills, and the various other projects) at the incredible sum of forty-eight millions sterling; from twenty-two to thirty-six thousand labourers were constantly employed on the works. A camp was formed for the workmen near the spot, the limits of which were strictly guarded; and it was criminal even to notice the vast waste of life in the soldiers employed, 10,000 of whom are said to have fallen victims to excess of fatigue, and to an epidemic disease caused by the exhalations from the swampy ground.

London experienced an unexampled series of calamities. First harassed by the civil war; next desolated by the plague; after this oppressed by the exactions of the unsuccessful war of Charles; and last ravaged by the dreadful fire, which laid the whole city in ashes. But with all this, the courage and the spirit of the people were not borne down; and with one heart and one mind, in the very reeking ruins, the restoration of the city, with increased grandeur, was undertaken. It is difficult to refrain from entering at length into the details of this dreadful calamity, particularly when there are such materials as the lively pen of Evelyn (an eye-witness) affords; but it is impossible not to note the magnanimity of the people, as described by the Bishop of Rochester, a writer far too courtly to attribute any very exaggerated merit to the humbler classes of society. He describes them "as enduring this, the second calamity, with undaunted firmness of mind; their example," he says, "may incline us to believe that not only the best natural, but the best moral philosophy too, may be learned from the shops of mechanics. It was indeed admirable to behold with what constancy the meanest artificers saw all the labour of their lives, and the support of their families, devoured in an instant. They beheld the ashes of their houses, and gates, and temples, without the least expression of pusillanimity. If philosophers had done this, it had well become their profession of wisdom; if gentlemen, the nobleness of their breeding and blood would have required it; but that such greatness of heart should be found amongst the *poor artisans and the obscure multitude* is, no doubt, one of the most honourable events which ever happened."—The Bishop's habits and prejudices led him to be surprised at finding greatness and forbearance amongst the lower orders of a free and independent people. If he had not learnt better from history, the subsequent struggles of those very persons, under the still greater calamities induced by the oppression of the Stuarts, would have afforded him new ground for admiration.

Charles, during his residence abroad, had imbibed a taste for the arts, particularly for architecture, and amidst his sensualities and misgovernment was not unmindful of their advancement. Upon his deciding to repair St. Paul's, to reinstate Windsor Castle, and to build a new palace at Greenwich, Wren (who to his other attainments added a considerable knowledge of architecture) was sent for from Oxford in 1661, to assist Sir John Denham, the new surveyor general. In the same year he took the degree of doctor of laws.

Denham was a partisan of the court in the troublesome times of Charles I., and was rewarded by his master with a grant in reversion of the place of Surveyor General of the Board of Works, to take effect on the death of Inigo Jones. As a poet and as a loyalist his merits are admitted; but his reward might have been more judiciously selected, for he was entirely ignorant of architecture. "It would have been ungrateful in the king, on his restoration," observes Mr. Elmes, with great simplicity, "to have discharged Denham, and unsafe to have intrusted him with the execution of any great work." Few men, it must be admitted, could so ill afford to add to the list of their acts of ingratitude towards their followers and dependants as Charles: Denham remained surveyor with the salary, Wren was appointed his deputy,—and performed all the duties of the office. Although appointed, he held the place for some time before he received any important public employment; and the Infanta of Portugal having brought the expensive dowry of Tangier, it was proposed to Wren, on account of his knowledge in geometry, to proceed there to survey and direct the works at the mole, harbour, and fortifications: this, however, he wisely declined.

During his progress in making plans for the repair of the Cathedral, the state and condition of which he appears very minutely to have ascertained, he was employed to give a design for the erection of the new theatre (Sheldonian) at Oxford, the principal merit of which is in the scientific construction of the flat roof, which is 80 by 70 feet without any arched work or pillars to support it, and is said never to have been surpassed. Plott, who in his history of Oxford has given a detailed description of it, calls Wren the English Vitruvius. Cambridge also was not slow to require his services, and his first commission was for a design for the new chapel of Pembroke Hall, of which his uncle had been a liberal benefactor. The celebrated library of Trinity College was also one of his early works.

CHAPTER IV.

On the form of the early Churches.

Before we enter on the subject of the erection of St. Paul's, confessedly the second of the cathedral edifices in Europe, it will not, we conceive, be out of place shortly to trace the origin of the present form of Christian Churches from the simple plans of the Temples of antiquity. Those of the Egyptians and Greeks were in the figure of a parallelogram again divided into squares or other parallelograms; and it probably was not till the Pantheon at Rome was erected, that the Grecian Tholos or circular temple was attempted on so great a scale. The religious rites of the Greeks and Romans were all performed in the open air, either in the front of their temples, or in the midst of the city; the early Christians, on the contrary, persecuted on all sides, sought refuge in caverns and catacombs hid from the light of day, for the solemnization of the rites of their religion, until encouraged and protected by Constantine they first began to assemble openly in congregations, and to worship without fear.

The largest of the ancient enclosed buildings were the halls of Justice called *Basilicæ*, or Royal Houses; it is supposed by some, that these were first appropriated by Constantine to the use of the Christian congregations, and being closed on all sides protected them from the fanaticism of their persecutors. The early Christian Churches were constructed on the model of these, and, up to the present period, have in some examples retained their name. The original form of an ancient temple was an oblong *cella*, or chamber surrounded with porticoes, or where the side porticoes were omitted there was always one in the front; but in the basilica the porticoes were internal, there being no exterior portico or colonnade; and the interior was divided by rows of columns either into three or five divisions. (*Fig.* 1. and 2.) In the centre

Fig. 1.

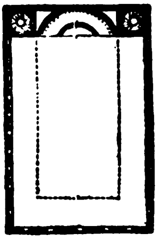
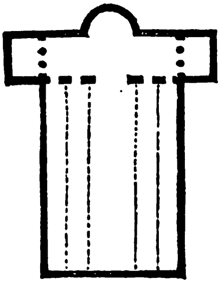


Fig. 2.



division (*fig.* 1.) the judge administered the law; and the side aisles, or porticoes, were occupied by the merchants and traders.

The first Christian Basilicas are referred to Constantine, and about the year 324 he erected the grand one of St. Peter's. It was divided into five aisles, running from east to west, and was terminated at the end by another aisle, or transept, from north to south, in the centre of which was a large semicircular niche, giving to the building an imperfect form of a cross, which he especially directed, as a memorial of that miraculous one which he had witnessed before his victory over Maxentius. The large aisle was enclosed by forty-eight columns of precious marble, and the side aisles had forty-eight columns of smaller dimensions: the whole was covered with a flat ceiling composed of immense beams cased with gilt metal, and Corinthian brass taken from the temples of Romulus and Jupiter Capitolinus. A hundred smaller columns ornamented the shrines and chapels; the walls were covered with paintings of religious subjects; and the tribunal, or niche at the end, was enriched with elaborate Mosaics or inlaid marbles. A vast number of lamps illuminated the temple; in the greater solemnities 2400 were reckoned, and 1360 of these were contained in an enormous candelabrum. It was on the site of this magnificent temple, which, falling into ruins, was pulled down by Julius II., that the present Basilica of St. Peter's was erected. In this sort of building the intersection of the aisles and the transept produced a centre which it was natural to enlarge and make the principal in the composition; this and the form of the Cross (the emblem of Christianity) were the cause of the deviations from the ancient form of the Basilica; and the invention of domes supported on pendentives added a size and dignity to the centre, without interrupting the vista of the aisles.

The disposition of the ancient St. Peter's at Rome was followed by Constantine in the church which he erected in his new capital of Constantinople. This being destroyed, Justinian employed Anthemius and Isodorus to erect a magnificent temple that should immortalize his name, and in this they first ventured on the novel construction of adding a dome, remarkable for its diameter and flatness, over the centre. The plan of this Basilica is a square of about two hundred and fifty feet; the interior forms a Greek cross, *i. e.* one with equal arms: the aisles are terminated at two ends by semicircles, and at the other two by square recesses: the aisles are vaulted, and the centre (where the aisles and transept intersect) forms the large square on which is raised the dome, of about one hundred and ten feet in diameter. The dome is supported on the four arches and the pendentives, or spandrils, which connect the square plan of the arches, and gradually form a circle at the level of their summit.

In consequence of the true principles of this mode of building not being discovered, the architects fell into many difficulties, and it was only after experiencing several failures, among them the falling of half the dome, and adding strong buttresses, that they were enabled to accomplish the glory of this magnificent design. These difficulties were, however, obviated in the building of St. Peter's, as in the dome and cone of St. Paul's, by adopting a much larger segment of a circle, and by inserting strong chains in the stone work at the base of the dome immediately over the arches, so as to give the lateral pressure a perpendicular bearing.

On the revival of the arts, this Basilica, the most magnificent and the last of the Lower Empire, was that which most influenced the form and character of the new temples. The Venetians in the tenth century copied with success the best parts of the disposition of Santa Sophia in the church of St. Mark, (now destroyed;) and it was probably the first of any extent which in Italy was constructed with a dome supported on pendentives or spandrils, and which gave the idea imitated in St. Peter's, of accompanying the great dome of a church with smaller and lower domes, to give a pyramidal effect to the whole. The church of Santa Maria del Fiore at Florence, from the magnitude of its dome, and the skill which Brunelleschi displayed in its construction,* acquired a celebrity that made the system of domes prevalent, till it was finally established in the church of St. Peter's, the grand type of all others. It was in the beginning of the sixteenth century that Bramante formed the magnificent design of suspending over the centre of the Basilica a circular temple as large as the Pantheon;—raising, as he expressed it, the Pantheon on the Temple of Peace; and in the completion of this great work, Michael Angelo was occupied till his death.

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* See *Vasari's Life of Brunelleschi.*

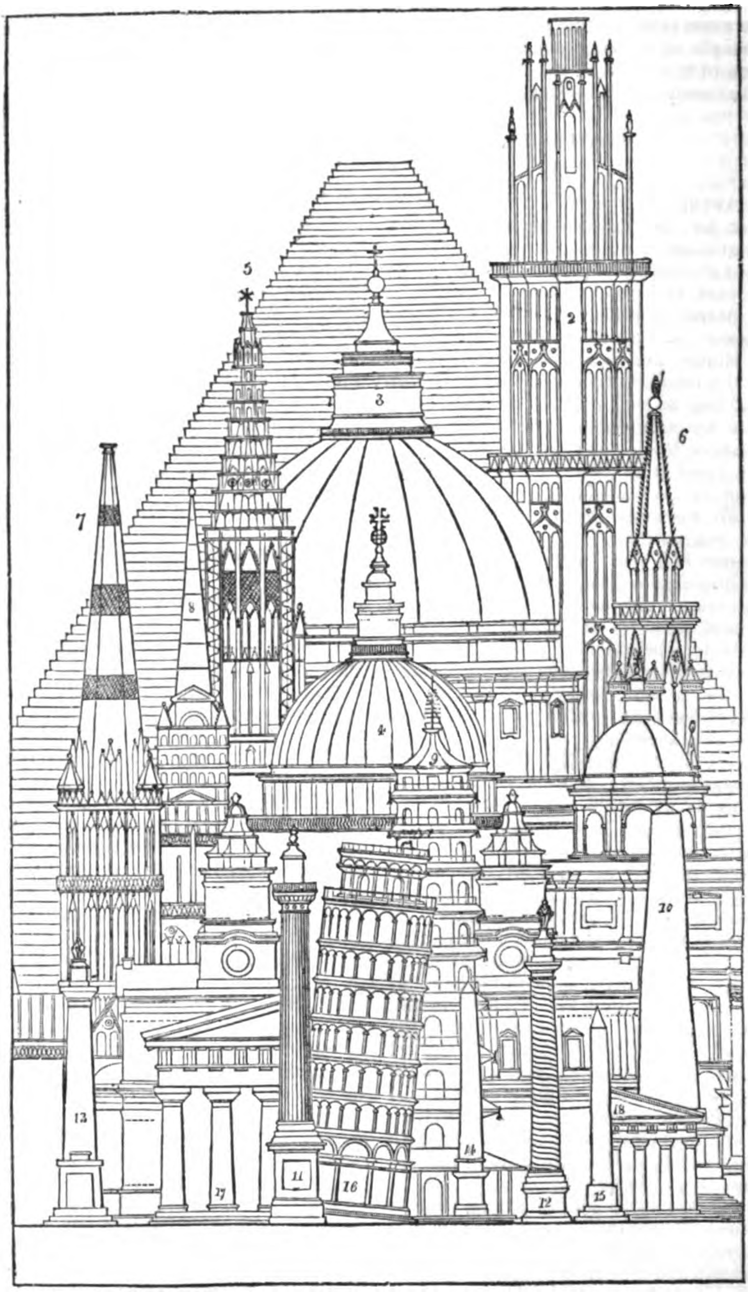
Chapter V.

St. Paul's.

After the nomination of the commission for the building St. Paul's, much discussion arose as to the plan. Wren's first design was to have but one order instead of two, and without any side oratories or aisles, these being only necessary for the ceremonies of the church of Rome: and this noble design appears in the beautiful model made by Wren, and kept in the present cathedral. The side aisles, however, were added either because their omission was considered too great a departure from the usual form of cathedrals, or (as is supposed by Mr. Spence in his anecdotes) because the suggestion of the Duke of York (James II.) was followed, and he was willing to have them ready for the Roman catholic service as soon as an occasion should arise. The addition of the side aisles is to be lamented, as they narrowed the building and broke in upon the beauty of the design; and the architect (observes Spence) insisted so strongly on the prejudice they were to the building, that he actually shed tears on speaking of it; but he remonstrated in vain. It would seem that this sort of interference is a misfortune peculiarly incidental to architects. Few would pretend to have a voice in the composition of a picture or the arrangement of a group of statuary; yet there is scarcely the work of any great architect, in the execution of which he has not in a great measure been compelled to abandon his original design, and adopt the suggestions (often incongruous) of his employers. Michael Angelo, in particular, was exposed to a like persecution, in his great work of St. Peter's, and alike had the harmony and beauty of his design impaired. After much cavilling the different objections were removed; Wren received an express order from the king to proceed according to his own plans; he was allowed to make what variations he pleased, and the whole was left to his own management. In thirty-five years from the commencement of the building, the highest and last stone was laid by Christopher, the son of the architect. Thus was this splendid edifice, admitted to be the second for grandeur in Europe, completed in thirty-five years by one architect, under one bishop of London, costing only 736,000*l.*, which was raised by a small impost on coals brought to London; whilst St. Peter's, the work of twelve architects, took one hundred and forty-five years to build, during the pontificate of nineteen popes.

One of the principal objections to the edifice is, that Wren chose two orders instead of one and an attic story, as in St. Peter's. That he intended to have adopted the single order (going from the top to the bottom) appears from what we have before stated. But whilst Bramante, for the erection of St. Peter's, had the quarries of Tivoli at his command, which yielded blocks of nine feet in diameter, amply sufficient for his columns, Wren had only the quarries of Portland, and from them he could not reckon on blocks greater than four feet in diameter, nor were even these readily procured; on which account, and that he might keep the just proportions of his cornice, (which Bramante, by the failure of the stone, had been compelled to diminish,) he finally determined on the use of two orders.

The dome of the Pantheon is no higher within than its diameter; the dome of St. Peter's is two diameters; and this appears too high, the other too low: Wren took a mean proportion, which shows its concave every way, and is lighted by the windows of the upper order, which permit the light to strike down through the great colonnade that encircles the dome without, and serves at the same time for the abutment of the dome itself, which is of two bricks thick, every five feet high having a course of bricks eighteen inches long bonding through the whole thickness. In consequence of the prejudice in favour of steeples, and that no disappointment might arise of the new church falling short of the old one, Wren, to give a greater height than the cupola would gracefully admit of, felt compelled to raise another structure over the first cupola. For this purpose he constructed a cone of brick, so as to support the vast stone lantern which surmounts it. This cone was covered with an oak roof, and this again with lead, in the same manner as the other parts of the church. Between this outside covering and the brick cone there are stairs to ascend to the lantern, lighted



1. Great Pyramid.
2. Spire of Mechlin.
3. St. Peter's.
4. St. Paul's.
5. Strasburgh Cathedral.
6. Hotel de Ville, Brussels
7. Salisbury Spire.
8. Notre Dame, Paris.
9. Pagoda by Sir W. Chambers.
10. Wellington's Testimonial.
11. Monument, London.
12. Trajan's Column.
13. Nelson's Column.
14. Obelisk, front of St. Peter's.
15. Cleopatra's Needle.
16. Leaning Tower at Pis .
17. Temple of the Giants, Agrigen-tum.
18. Parthenon.

from the lantern above, which did away with the necessity of making the small ugly windows in the dome, as at St. Peter's. The inside of the whole cupola is painted by Sir James Thornhill, in eight compartments. In the crown of the vault, as in the Pantheon, there is a circular opening, by which not only the lantern transmits light, but the inside ornaments of the painted and gilded cone display a new and agreeable scene. Instead, however, of painting the dome, Wren had proposed it should, like that of St. Peter's, be enriched with the more durable and appropriate ornament of Mosaic, and had procured artists from Italy for its execution; but the ignorance and the prejudice of the persons employed as commissioners, in this, as in other cases, thwarted his views. The ornaments at the East end he designed should only be temporary, till the materials for the completion of a magnificent altar which he had planned could be procured.

Fig. 4.

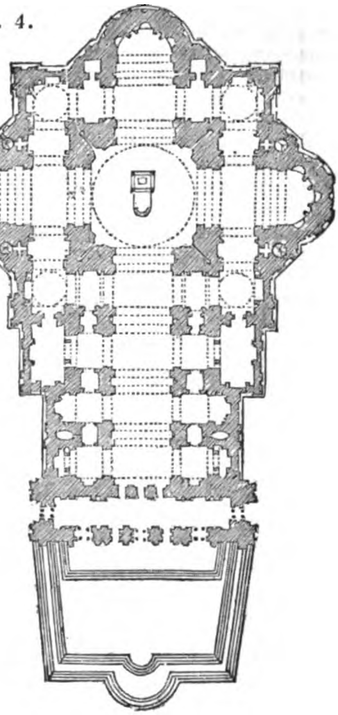
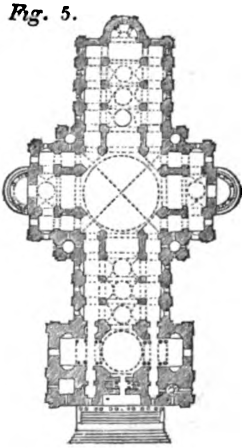


Fig. 5.



In scale* and beauty of internal ornament, as well as material, situation, and climate, the work of Wren cannot come in competition with its great rival; but in architectural excellence it has fair claims to be placed on an equality; surpassing it in some things, if in others it falls short. The portico in front of St. Peter's, both for its beauty of proportion and vast size, is admitted to be a feature of high excellence and without any match in St. Paul's; yet the whole flat front of St. Peter's, terminating in a straight line at the top, cannot be said to afford such a pleasing variety as is bestowed by the elevation of the pediment in the middle, and the beautiful campanile towers at each end of the front of St. Paul's. One of the happiest parts of the invention is in the intersection of the three vistos of the nave, the aisles, and the cross and transept, attained by the octangular arrangement of the piers, which is as beautiful as it is novel, giving four additional views to the usual arrangement, and with an effect remarkable for its boldness and lightness. Figures 4 and 5, exhibit the ground plans of the two buildings drawn on the same scale; the peculiarity noticed in the ground plan of St. Paul's is pointed out by the dotted lines. In St. Peter's the whole building is surrounded by a repetition of vast pilasters. In St. Paul's, however, take the building in any point of view, it

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* *Relative Sizes.*

	St. Peter's.	St. Paul's.
Long within	669 . .	500
Broad at the entrance . .	226 . .	100
Front, without . . .	395 . .	180
Broad at the cross . . .	442 . .	223
Cupola, diameter . .	139 . .	108
Cupola and lantern, high .	432 . .	330
Church, high . . .	146 . .	110
Height of pillars in front .	91 . .	40

is highly picturesque, the different returns and façades affording endless variety of views; no patching, no incongruous additions disfigure the unity of the composition, which, as a whole, for harmony of design and justness of proportion, has certainly never been surpassed.

With respect to the charge of plagiarism from the work of Michael Angelo, the two buildings are sufficiently different utterly to rebut this. The Romans adapted to their purposes the beauties of the architecture of Greece, combining them so as to suit their intentions; and Palladio, abandoning the barbarous taste of the middle ages, adapted the great remains both of Greek and Roman antiquity to the genius of the times, but did not repeat or copy them. Michael Angelo availed himself of the Pantheon in his cupola, and Wren, again, availed himself of the knowledge of M. Angelo; but there is nothing like servile copying, or unmeaning adaptation, in any one part of his work. To form a just idea of the relative sizes of the two buildings, we have added an outline, showing the comparative size of St. Peter's and St. Paul's, and the vacant spaces have been filled up with the outlines of some of the most remarkable buildings now existing, all on the same base and all drawn on the same scale, but unfortunately, owing to an error, the height of St. Paul's in the figure is a little less than it should have been. The buildings have principally been taken from the work of Mons. Durand, *The Parallel of Architecture*, by far the most important production of the kind which has yet been published, and affording great facility for the consideration of the general principles of architecture. It consists of ninety large folio plates, containing elevations and plans of the principal ancient and modern buildings and monuments, all drawn on the same scale. It is a matter of regret, that it is defective, inasmuch as, (either from jealousy or ignorance,) among the ninety plates, neither Westminster Abbey, York Cathedral, Greenwich and Chelsea Hospitals, our bridges, nor even our docks, (the largest in the world,) are inserted; and amongst the plans of English theatres, the only one given is that in the Haymarket.

In addition to the total want of the rich ornaments and the costly materials which adorn the interior of the church of St. Peter, it also far surpasses the building of Wren in the nature of the materials with which it is constructed. It has been a matter of regret that the quality of the stone used in the public buildings of this country has been hitherto but little attended to. Many of the public edifices of London, Edinburgh, Bath, and Oxford, furnish melancholy instances of the want of judgment in this choice of materials. It is obvious that the stone which is most porous, will, when exposed to the weather, be least durable: water lodges in its pores and penetrates the crevices, and by the mere change of temperature does mischief; but during frost the expansion is so great, that in a single winter the sharp parts often entirely crumble away. The fitness of the different species of sandstone for the purpose of building, may in a great measure be judged of by immersing the specimens in water, each being previously weighed, and all of one size; the excellence of the stone will be inversely to the quantity of water absorbed. The magnesian limestone, so abundant in England, is considered the best adapted for architectural purposes; it is far preferable to that termed the Oolite of Somersetshire and the Isle of Portland, of which the most important buildings have hitherto been constructed. Rain water always contains carbonic acid, which acts chemically on limestone, but less on those kinds which are fine grained and magnesian, than those which are coarse and free from magnesia; and although this often produces an external hardening, as in the Bath stone, it is only the forerunner of a more quick peeling off and destruction. It is obvious, that for durability, the granites, sienites, whinstones, and porphyries, are most to be preferred. The Strand Bridge is a magnificent example of the use of granite; the exterior being entirely constructed of two sorts, the coarse-grained granite of Devon and Cornwall, and the fine-grained and harder sort from Aberdeen, used for the balustrades, and stronger than that from Cornwall, as 22 to 14. The only means of proving the respective durability of them is from the effect of time; and the Cornish granite evidently appears to have suffered more decay than the harder stone of the North. Granite, however, independently of the great increase of expense incurred in the working it, is unfitted for all the finer parts of ornamental work;

in that case it would be well to adopt the marble or dolomite of Scotland, or the magnesian limestones, so much to be preferred to the perishable sand and lime stones of the west of England.* But the subject has not yet received its due share of attention from those whose pursuits and knowledge best enable them to form an accurate judgment upon it.

Although Wren's new employments occupied much of his time, his zeal for the advancement of science never forsook him; but, as he employed himself in the practical parts of building, his communications to the Royal Society became more technical, and applied principally to his own art. A very interesting letter to Lord Brounker, the first president of the Royal Society, is given by Mr. Elmes: it is in answer to a request to provide something for the suitable entertainment of his majesty, who had purposed visiting the Society. Upon this Wren observes, "The experiments for the establishment of natural philosophy are seldom pompous; it is upon billiard and tennis balls, upon the purling of sticks and tops, upon a vial of water, a wedge of glass, that the great Des Cartes has built the most refined and accurate theories that human wit ever reached to; and certainly nature, in the best of her works, is apparent enough in obvious things, were they but curiously observed; and the key that opens treasures is often plain and rusty, but unless it be gilt, the key alone will make no show at court." It does not appear how the philosophers succeeded in entertaining their royal guest. Wren in 1673 resigned the Savillian professorship, which he had held so long with credit. He was twice in Parliament, though it does not appear that he took any active part in the debates. In 1680 he was elected President of the Royal Society, and before that period he had been knighted by Charles II.

The delight one can well conceive a person of Wren's genius to have enjoyed, in the contemplation of the rise of the vast edifice which his creative genius had called into existence, was not undisturbed or unalloyed. Many improper persons were joined with him in the commission; and they, having private interests to serve, and selfish feelings to indulge, were thwarted by the inflexibility of Wren, who exposed at once their meanness and their ignorance. This, it may be supposed, was neither forgotten nor forgiven; and they joined in a cabal, persecuting him with every species of bitter malevolence. It will scarcely be supposed that one of Wren's genius and talent, of his gentle bearing towards all, his high patriotic feeling, at once the judge and the patron of every thing that was useful either in the arts or sciences, should have been subjected to the petty cavilling of a few interested persons without greatly retarding the progress of the building. But this was not all; the party having procured a clause to be inserted in an act of parliament, suspending a moiety of his pittance (200*l*. a year) till the building was finished, Wren was kept out of his money long after it was due, under the pretence that the building was not complete, whereas the cavillers themselves, by their impediments, alone hindered its completion. He was in consequence obliged to petition Queen Anne; and in his memorial he states, that the arbitrary proceedings of some of the commissioners had alone obstructed his measures for the completion of the work. This was handed over to the commissioners themselves for their answer, who replied by mean and paltry excuses. Wren, however, was not to be borne down by a low cabal: he next addressed the Archbishop of Canterbury and the Bishop of London, and the document itself affords ample testimony of the treatment he had received.

"The design of the parliament (he states) in granting the coal duty for the said cathedral, being to have the building completed with all possible speed, they did, to encourage and oblige the surveyor's diligence in carrying on the work, suspend half his allowance till all should be done. Whereby, I humbly conceive, it may justly from thence be implied, that they thought the building, and every thing belonging to it, was wholly under my management and direction, and that it was in my power to hasten or protract it. How far it has been so your lordships know, as also how far I have been limited and restrained. However, it has pleased God so to bless my sincere endeavours, as that I have brought the building to a conclusion, so far as is in my power; and I think nothing can be said now to remain imperfected, but the iron fence round the church, and painting the cupola, the directing of which is taken out of my hands, and therefore I hope that I am neither answerable for them, nor that the said suspending clause can, or ought to, affect me any further on that account. As for painting the cupola, your lordships know it has been long under consideration; that I have no power left me concerning it; and that it is not resolved in what manner to do it, or whether at all. And as for the iron fence, it is so remarkable and fresh in memory by whose influence and importunity it was wrested from me, and the doing it carried in a way that I may venture to say will ever be condemned. I have just this to observe further, that your lordships had no hand in it; and consequently ought not to share in the blame that may attend it.

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* Brande's Journal, vol. iii. 381.

"This, then, being the case, and nothing left that I think can keep the same clause of suspension any longer in force against me,

"I most humbly pray your lordships to grant your warrant for paying me what is due to me on that article, which was 1,300*l.* last Michaelmas. And if for the future my advice and assistance be required in any thing about the said cathedral, I will be ready to give the same, and to leave the consideration of it to your lordships."

This representation not succeeding, he applied at once to parliament, who rendered him that tardy justice, the long denial of which reflects so much disgrace on those who opposed his just claims.

"Whereupon that honourable and august assembly," says Sir Christopher,* "so considered his case, and were so well satisfied with the justice and the reasonableness of it, as to declare the church to be finished so far as was required to be done and performed by him as surveyor-general. And it was accordingly enacted, that the suspended salary should be paid him on or before December the 25th, 1711, which he has the truest sense of, and has not, he hopes, been wanting in all due acknowledgments and returns for it. Neither is it possible that he, or his posterity should ever forget so signal and distinguishing a favour, while he can remember the unjust and vile treatment he had from some in the late commission for St. Paul's; which was such as gave him reason enough to think that they intended him none of the suspended salary, if it had been left in their power to defeat him of it."

By the death of Anne, Wren lost the last of his royal patrons; in the new reign, the king's partiality for his German subjects and their connections deprived him of the sunshine of royal favour. His talents, his uprightness, and his fame were all forgotten: the corruption of that period in the disposal of patronage is well known. At last, after a severe struggle in the 86th year of his age and the 49th of his office as surveyor-general, he was deprived of his patent in favour of one Benson, his German influence prevailing over one who would not condescend to truckle even to a court, and whose life, as Walpole observes, having enriched the reign of several princes, disgraced the last of them. The intrigue which deprived him of his office is noticed in the memoirs of John Ker of Kersland; who states that, "so great was the influence of Benson, (a favourite of the Germans,) that Sir C. Wren, the famous architect who contrived the stately edifice of St. Paul's church, was turned out of his employment to make way for this favourite of foreigners." Pope also in a note to the *Dunciad* says, "In favour of this man, the famous Sir C. Wren, who had been architect to the crown for above fifty years, who built most of the churches in London, laid the first stone of St. Paul's, and lived to finish it, was displaced from his employment at the age of 90 years."

It may, indeed, be observed, that Wren's son was at this time member for Windsor, and probably some opposition to the wishes of the court might have had an influence on the father's fall. Benson himself, however, was soon disgraced and removed on the discovery of his ignorance and incapacity, and marked for public prosecution for his dishonesty; but the same influence, which had caused his original elevation, at once stopped the prosecution and loaded him with disgraceful rewards out of the public purse,* in the shape of reversionary grants and crown leases.

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* In a pamphlet which he published stating his case, and for the purpose of answering an attack made on him in a pamphlet entitled "Fraudulent Abuses at St. Paul's."

* Benson and Wren each had his due notice in the *Dunciad.*

Benson, sole judge of architecture, sit,
And namby pamby be preferred to wit;
While Wren with sorrow to the grave descends
Gay dies unpension'd with a hundred friends.

The following curious paper of Wren's is given by Mr. Elmes: it is in answer to the commissioners, who insisted on a balustrade to St. Paul's, none having been originally designed; and it is one of the long series of attacks which were made on him by his enemies.

"I have considered the resolution of the honourable the commissioners for adorning St. Paul's Cathedral, dated October 15, 1717, and brought to me on the 21st, importing that a balustrade of stone be set up on the top of the church, unless Sir Christopher Wren, in writing under his hand, set forth, that it is contrary to the principles of architecture, and give his opinion in a fortnight's time; and if he doth not, then the resolution of a balustrade is to be proceeded with.

"In observation of this resolution, I take leave, first, to declare I never designed a balustrade. Persons of little skill in architecture did expect, I believe, to see something they had been used to in Gothic structures; and *ladies think nothing well without an edging.* I should gladly have complied with the vulgar taste, but I suspended for reasons following:

"A balustrade is supposed a sort of plinth over the upper colonnade, which may be divided into balusters over open parts or voids, but kept solid over solid parts, such as pilasters; for a continued range of balusters cannot be proposed to stand alone against high winds: they would be liable to be lopped down in a row, if there were not solid parts at due distances intermixed, which solid parts are in the form of pedestals, and may be in length as long as the frieze below where pilasters are double, as in our case; for double pilasters may have one united pedestal, as they have one entablature and one frieze extended over both. But, now, in the inward angles, where the pilasters cannot be doubled, as before they were, the two voids or more open parts would be in the angle with one small pilaster between them, and create a very disagreeable mixture. I am further to observe, that there is already over the entablature a proper plinth, which regularly terminates the building; and as no provision was originally made in my plan for a balustrade, the setting up one in such a confused manner over the plinth must apparently break into the harmony of the whole machine, and, in this particular case, be contrary to the principles of architecture.

"The like objections as to some other ornaments, suppose of vases, for they will be double upon the solids; but in the inward angles there will be scarce room for one, though each of them be about two feet nine inches at bottom, and nine feet high: yet these will appear contemptible below, and bigger we cannot make them unless we fall into the crime of false bearing, which artisans of the lowest rank will have sense enough to condemn.

"My opinion, therefore, is to have statues erected on the four pediments only, which will be a most proper, noble, and sufficient ornament to the whole fabric, and was never omitted in the best ancient Greek and Roman architecture; the principles of which, throughout all my schemes of this colossal structure, I have religiously endeavoured to follow; and if I glory, it is in the singular mercy of God, who has enabled me to begin and finish my great work so conformable to the ancient model.

"The pedestals for the statues I have already laid in the building, which now stand naked for want of their acroteria.

"CHRISTOPHER WREN."

These details respecting the erection of a building which (if we except St. Peter's) is unrivalled in the world, will not, it is hoped, appear either trifling or tedious, but give an additional interest to the contemplation of that splendid monument of Wren's genius.

The character and fate of Michael Angelo and Wren were in many respects akin: remarkable alike for the universality of genius, each the builder of the greatest work of architecture of his time, each untainted by any vice, and regardless of private interests, (for Michael Angelo received no remuneration on account of St. Peter's,) they were both persecuted by the envious, and each had his works altered by the ignorant. Michael Angelo's severe honesty, in compelling those who received pay to give their labour in return, conjured up a whole host of enemies; and sickened with these obstacles he sought to free himself by the resignation of his charge. "I entreat your eminence," he writes to Cardinal Carpi, "to liberate me from this vexatious employment, which, by the command of the popes, I undertook seventeen years ago, during which period I have given manifest proofs of my zeal in the prosecution of the work. I again earnestly entreat I may resign, which would be conferring on me the greatest favour."

Amongst the many willing to do justice to the merit and the modesty of Wren, when labouring under the persecution of court intrigue, was Sir Richard Steel, who, in his *Tatler*, No. 52, under the character of Nestor of Athens, observes that "his art and skill were soon disregarded for want of that manner with which men of the world support and assert the merits of their own performances; this bashful quality still put a damp on his great knowledge, which has as fatal an effect upon men's reputation as poverty, for it is said, (Ecclesiasticus, ch. ix. v. 15,) *The poor man by his wisdom delivered the city, yet no man remembered the same poor man.* So here we find *the modest man built the city, and the modest man's skill was unknown;* but surely posterity are obliged to allow him that praise after his death which he so industriously declined while he was living."

CHAPTER V.

To the End of his Life.

WREN quitted the field without a struggle; he retired in peace from the world to his home at Hampton Court, without being affected by any of that bitterness or those angry feelings which the ingratitude and injustice of a court so often engender in minds of less noble stamp, saying, *Nunc me jubet fortuna expeditius philosophari.* Cheerful in his solitude, and as well pleased to die in the shade as in the light—his son observes of him in the *Parentalia,* "that the vigour of his mind continued with a vivacity rarely found in persons of his age, till within a short period of his death, and not till then could he quit the great aim of his whole life to be (to use his own words) a benefactor to mankind; his great humanity appearing to the last in benevolence and complacency, free from all moroseness in behaviour or aspect; he was happily endued with such an evenness of temper, steady tranquillity, and Christian fortitude, that no injurious incidents or inquietudes of human life could ever ruffle or discompose."

The five remaining years of his life were passed in complete repose. Returning occasionally to superintend the repairs of Westminster Abbey, his only remaining public employment, he divided his time between the study of the Scriptures, which were at once his guide and his delight, and in the revision of his philosophical works, more particularly those upon the Longitude, and his tracts on Mathematics and Astronomy. Time, which had enfeebled his limbs, left his faculties unclouded till nearly the end of his existence. His chief delight to the very close of life was, that of being carried once a year to see his great work; "the beginning and completion of which," observes Walpole, "was an event which one cannot wonder left such an impression of content on the mind of the good old man, that it seemed to recall a memory almost deadened to every other use."

Wren's dissolution was as placid as the tenour of his existence had been. On the 25th of February, 1723, his servant conceiving he slept longer after his dinner than usual, entered his room, and found him dead in his chair.—He, to whom in his latter days all distinction had been denied, received, as frequently happens, the tardy honour of a splendid funeral; his remains were deposited in the crypt under the southernmost window of the choir of the Cathedral which he had raised; a plain black slab alone covers the coffin, but no monument beyond the Pile itself attests his goodness or his greatness. On the western jamb of the window of the crypt, is a tablet with this inscription:

Subtus conditur
Huius ecclesiæ et urbis conditor
Ch. Wren,
Qui vixit annos ultra nonaginta
Non sibi sed bono publico.
Lector, si monumentum quæris
Circumspice.[*]

Robert Milne, one of his successors in the care of the cathedral, caused this inscription to be placed in gilt letters in a tablet in front of the skreen of the organ: and it is a reproach to the nation and to the age, that no other monument has ever been erected. Indeed, until Mr. Elmes's volume, (with the exception of the *Parentalia,*)[†] no biographical notice of him had been published. We trust, however, that before long Mr. Cockerel, the present architect to St. Paul's, who has lately superintended its repairs with so much judgment, will carry into effect an intention he is known long to have entertained, of giving to the world a critical account of Wren's most important architectural works, accompanied by a selection from the large collection of drawings now in the library of All Souls' College. Till this shall be done, it can hardly be said that his professional merits can be duly appreciated. Mr. Cockerel's attainments and talents afford a pledge that the work will be all that either the architect or the amateur can require.

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[*] "Beneath is laid the builder of this church and city, Christopher Wren, who lived above ninety years, not for himself but for the public good. Reader, if thou seekest for his monument, look around."

[†] *Parentalia, or Memoirs of the Family of the Wrens*, folio, London, 1750. This work was commenced by the son of Sir C. Wren, and was not completed till thirty years after his death, when it was published by his grandson, Stephen Wren. The work itself is of little interest; most of the facts it records have been adopted by Mr. Elmes, in his *Life of Wren*, 4to., 1823, and from these two works the biographical part of the present treatise has been chiefly compiled.

Wren was twice married; first to the daughter of Sir Thomas Coghill, by whom he had one son, Christopher. He afterwards married a daughter of William Lord Fitzwilliam, Baron of Lifford, in Ireland, by whom he had a son and a daughter. The family is not extinct: Mr. Elmes mentions two daughters, and the son of his grandson Stephen, and Christopher Wren, the son of their cousin, of Wroxhall-abbey, in Warwickshire, a seat of Sir C. Wren's, where his only son, Christopher, is buried.

In considering the life of Wren we are struck with the splendour of his abilities, the greatness of his pereseverance and labour, the scantiness of his remuneration, and the ingratitude and injustice which he experienced towards the close of his long and arduous course. When the prices paid in these days to artists are called to mind, what must be the surprise at learning that the whole salary paid to the arehitect of St Paul's was only 200*l.* a year. Wren afforded all his services in the building of Greenwich Hospital, without any salary or emolument, preferring in this, as in every other passage of his life, the public service to private advantage. And it will be observed, that his salary of 200*l.* a year was not paid for his mere designs and time; it included the whole expense of models and drawings of every part, the daily overseeing of the works, the framing of the estimates and contracts, and auditing the bills. Without making any invidious comparison, it cannot be denied, that of late there have been few such examples shown of disinterested services towards the public by artists employed in situations similar to his. The scantiness of his pay was more than once noticed by the writers of the time; and Sarah Duchess of Marlborough, in a letter* respecting the charges of one of the persons employed to superintend the completion of Blenheim, who had made a charge of 300*l.* a year for his services, beside a salary for his clerk, complains bitterly at being compelled to pay this, "when," she observes, "it is well known that Sir C. Wren was content to be dragged up in a basket three or four times a week to the top of St. Paul's, and at great hazard, for 200*l.* a year."—Her Grace was perhaps but little capable of drawing any nice distinction between the feelings of the hired surveyor of Blenheim, and those of our architect in the contemplation of the rising of the fabric which his vast genius was calling into existence: her notions led her to estimate the matter by the simple process of the rule of three direct; and on this principle she certainly had good reason to complain of her surveyor.

CHAPTER VI.

His other Works.

IN addition to the great work of St. Paul's, Wren, who was appointed the architect for the rebuilding of the whole city, superintended the erection of all the churches, amounting to more than fifty; he was also the architect and contriver of Chelsea College, and the principal officer and comptroller of the works at Windsor. A considerable part of Greenwich Hospital was erected by him, and a splendid palace for a hunting seat of Charles II., now turned into a barrack, was commenced at Winchester. In addition to all these duties, a large proportion of his time was occupied, after the fire of London, in setting out and ascertaining the sites of the different houses destroyed—an employment little suited to his genius, and which involved him in endless altercation. His pay as the architect for rebuilding the churches in the city, was not more liberal than for St. Paul's, being no more than 100*l.* a year; the parish of St. Stephen, Walbrook, however, appears, on his completing that admirable church, to have voted a present to his lady of twenty guineas!

In a sketch intended merely for general readers, it is not necessary to enumerate in detail the different churches erected by him: those which are most celebrated for the beauty and convenience of the interior, are St. Stephen's, Walbrook, St. Andrew's, Holborn, and St. James's Church in Piccadilly. St. Stephen's is, by many, considered as the most perfect specimen of Wren's genius; and it has not, perhaps, been surpassed by any modern edifice in elegance and unity of design. It is an oblong square of seventy-five by fifty-six feet; its peculiar beauty arises from the elegance of the vaulting, the form of the cupola, the disposition of the Corinthian columns, the lightness of the supporting arches, and the distribution of the light from above. A judicious and elegant writer on the *Public Buildings of London* observes, "that this building, so little known amongst us, is famous all over Europe, and is reputed the masterpiece of Wren. Perhaps Italy itself can produce no modern building that can vie with it in taste or proportion. There is not a beauty which the plan would admit of, that is not to be found here in its greatest perfection: and foreigners very justly call our taste in question for understanding its graces no better, and allowing it no higher degree of fame." Such is the reputation of this structure amongst foreigners, that an anecdote is told of an Italian architect who arrived in London and immediately returned after having visited St. Stephen's.

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* In the possession of W. Tooke, Esq.

The church of St. James, in Piccadilly, is divided, in the interior, into a nave and two aisles; the principal merit is in the formation of the roof, which is described from information furnished by Mr. Cockerel, as singularly ingenious and economical; and its simplicity, strength, and beauty, are represented as a perfect study of construction and architectural economy. Sir Christopher Wren, who himself conceived this to be one of the best contrived of his churches, observes in a letter—

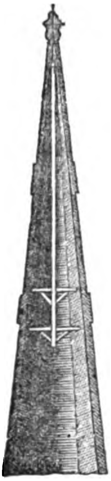
"Churches must be large: but still, in our reformed religion, it should seem vain to make a parish church larger than that all who are present can both *hear* and *see*. The Romanists, indeed, may build larger churches: it is enough if they hear the murmurs of the mass, and see the elevation of the host; but ours are to be fitted for auditories. I can hardly think it practicable to make a single room so capacious, with pews and galleries, as to hold above two thousand persons, and all to hear the service, and see the preacher. I endeavoured to effect this, in building the parish church of St. James, Westminster, which, I presume, is the most capacious with these qualifications that hath yet been built; and yet at a solemn time, when the church was much crowded, I could not discern from a gallery, that two thousand were present. In this church I mention, though very broad, and the nave arched up, yet as there are no walls of a second order, nor lanterns, nor buttresses, but the whole of the roof rests upon the pillars, as do also the galleries, I think it may be found beautiful and convenient, and, as such, the cheapest of any form I could invent."

The interior of St. Andrew's, Holborn, after St. James's Church, affords one of the best specimens of arrangement; spacious, rich, and beautiful. It has a nave and two aisles divided into a basement and galleries: the length is a hundred and five feet, the breadth sixty-three, and the height forty-three.

No architect can come in competition with Wren in the construction of the steeple, which is considered a requisite in Christian churches, and in the composing of which it required his genius to combine the excellence of the Roman architecture, with the requisites of height and lightness, to which it had not before been adapted with any success. The spire of St. Dunstan's in the East is admitted to be unrivalled for elegance, and is one of the finest monuments of geometrical skill in existence. That of Bow Church is also among the most elegant of Wren's works; the bottom is a plain tower till it rises over the houses; above this is a beautiful temple, and over it stand flying buttresses supporting a lighter temple, surmounted by a spire. Nothing can afford fuller evidence of his power to combine and adapt the elegant features of the Roman architecture, so as to suit the genius of the work. Wren has not fallen into the common error in building spires, of making the spire straddle across a Greek pediment and crush it with the weight; thus, the spire of Bow Church is built separately, and rises from the ground at an angle of the church.

Another curious work of Wren was the pendulum stage in the upper part of the spire of the Chichester Cathedral, which he rebuilt, to counteract the south-westerly gales, which had forced it from its perpendicularity. (*Fig.* 6) A sketch to illustrate this has been added from the work of Mr. Elmes. To the finial is fastened a strong metal ring, and to that is suspended a large piece of timber, 80 feet long, loaded with iron; at the bottom are two oak floors, the upper about two inches and a half, and the lower three inches less than the interior masonry of the spire. When the wind blows the spire out of the perpendicular, the pendulum floor touches the lee side of the spire, thus tending to restore the equilibrium of the masonry.

Fig. 6.



The Doric column at the foot of London Bridge, (Monument,) the largest single column in existence, except the Wellington testimonial, at Dublin, was also designed by Wren; its entire height is 202 feet, being 42 higher than Trajan's column; the pedestal is 40 feet high, 20 feet square; the diameter of the base is 15 feet, and there is a staircase in the shaft of 345 steps.

The works of Sir C. Wren do not appear to have been all uniformly successful. Hampton Court and Winchester Palace are far from being favourable specimens of the art. The studies made by him from the buildings of Louis the Fourteenth had too visible an effect on his own designs of palaces and private buildings; and "it may be considered fortunate," observes Horace Walpole, "that the French built only palaces and no churches, and therefore Saint Paul's escaped, but Hampton Court was sacrificed to the god of false taste." Wren's failure at Hampton Court may, in a great measure, be attributed to his having worked under the directions of William, whose favourite residence it was, and whose taste in architecture was far below his merit as a patriot king; indeed, when the arrangement of the low cloisters was criticized, the monarch, with his wonted honesty, took the whole blame on himself, acknowledging that they had been constructed by his own particular orders. Nor is it unreasonable to infer that in his other buildings, the defects arose in some degree from the taste of his employers, and that he was compelled by them to adopt the French fashions, which at that time retained the powerful influence in this country, which the profligate and frivolous court of Charles II. had bestowed upon them.

We have omitted to notice the College of Physicians,* built by Wren, which, in a particular department, was one of the most scientific of Wren's edifices. The exterior, indeed, was nowise to be admired; but in the interior, for the purposes of utility and convenience, it was considered perfect, as affording every facility both for seeing and hearing, in the display of anatomical operations and philosophical experiments. As a study of *acoustic* and *optical* architecture it was perhaps unrivalled, the peculiar character of the roof and form of the section being admirably adapted to the distribution of sound, and the form of the hall equally suited to the convenience of seeing.

In the construction of theatres and of churches, the propagation of sound is one of the most important points to be attended to. The doctrine of *acoustics* is little understood by builders in this country, and yet, however hidden to us the subject may be, it is certain the ancients understood its principles with great accuracy; whilst in modern times this important object of architecture has been almost wholly neglected. Vitruvius describes the effects of the science as well understood by the Greeks. The method of producing the effect of the increase of sound in their theatres was singular; and from the mention of it in Vitruvius, as being of frequent use both in these and in the Roman theatres, it is to be inferred that the effect sought was produced. The arrangement, as described, consisted in placing bronze vases or jars in small chambers or recesses having an opening in front in the *precinctio*, between the first and second row of seats. These jars were inverted, having one end partially raised: they were of different sizes, and are said to have been arranged according to some principle of harmony. It has been a matter of considerable surprise that, with the number of travellers who have been of late so actively exploring the antiquities of Greece and Italy, no remains of this contrivance have been discovered. Mr. Banks, however, it is said, discovered at Scythopolis the remains of these chambers situated in the precinctio, with doors at the back, apparently for the convenience of access to adjust the vases. This is an important subject of consideration in the construction of theatres, and more particularly in church architecture. In the present churches it not unfrequently happens that the architect ensures the congregation full opportunity of contemplating his edifice, by so building it that no articulate sound can reach half the persons present. There is another important point in the construction of churches, which has been hitherto mainly overlooked, namely, the advantage arising from what is termed *hypethral* light, or light from the roof. When this is adopted, the interior architecture has its own light and shade in the same way as the outside; and that solemn effect, so well adapted to sacred buildings, is attained by the appearance of seclusion and abstraction which the light coming from above instead of the sides is calculated to bestow.

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* This building is now dismantled.

Wren did not publish any works in his lifetime, except his contributions to the Royal Society, and his answer to the attacks made against him. In the *Parentalia*, a few fragments of essays are printed, some of which contain very judicious observations on the science of architecture. The limits of this sketch do not, however, permit any very long extracts; the following are, perhaps, the most interesting:

“ Position is necessary for perfecting beauty. There are only two beautiful *positions of strait lines*, perpendicular and horizontal; this is from nature, and consequently necessity, no other than upright being firm. Oblique positions are discord to the eye, unless answered in pairs, as in the sides of an equicrural triangle; therefore *Gothic* buttresses are all ill-favoured and were avoided by the ancients, and no roofs, almost, but spheric raised to be visible, except in the front, where the lines answer in spheric in all positions the ribs answer. Cones and multangular prisms want neither beauty nor firmness, but are not ancient.

“ Views contrary to beauty are deformity, or a defect of uniformity: and plainness, which is the excess of uniformity: variety makes the mean.

“ Variety of uniformities makes complete beauty. Uniformities are best tempered, as rhymes in poetry, alternately, or sometimes with more variety, as in stanzas.

“ In things to be seen at once much variety makes confusion, another vice of beauty. In things that are not seen at once, and have no respect one to another, great variety is commendable, provided this variety transgress not the rules of *optics* and *geometry*.

“ An architect ought to be jealous of *novelties*, in which fancy blinds the judgment; and to think his judges as well those that are to live five centuries after him, as those of his own time. That which is commendable now for novelty, will not be a new invention to posterity, when his works are often imitated, and when it is unknown which was the original; but the glory of that which is good of itself, is eternal.

“ The architect ought above all things to be well versed in *perspective*, for every thing that appears well in the orthography may not be good in the model, especially where are many angles and projections; and every thing that is good in model may not be so when built; because a model is seen from other stations and distances than the eye sees the building; but this will hold universally true, that whatsoever is good in perspective, and will hold so in all the principal views, whether direct or oblique, will be as good in great, if this only caution be observed, that regard be had to the distance of the eye in the principal stations.

“ Things seen near at hand may have small and many members, be well furnished with ornaments, and may lie flatter; on the contrary, all this care is ridiculous at great distances; there bulky members and full projections casting quick shadows are commendable; small ornaments at too great distance serve only to confound the symmetry and to take away the lustre of the object, by darkening it with many little shadows.

“ There are different reasons for objects, whose chief view is in *front*, and for those whose chief view is *sideways*.

“ Fronts ought to be elevated in the *middle* not the *corners*; because the middle is the place of greatest dignity and first arrests the eye; and rather projecting forward in the middle than hollow. For these reasons pavilions at the corners are naught, because they make both faults, a hollow and depressed front. Where *hollows* and *solids* are mixed, the hollow is to be in the middle; for hollows are either niches, windows, or doors. The first require the middle to give the statue dignity; the second, that the view from within may be direct; the third, that the visto may be straight. The ancients elevated the middle with a tympan and statue, or a dome, The triumphant arches, which now seem flat, were elevated by the magnificent figure of the victor in his chariot with four horses abreast, and other statues accompanying it. No sort of pinnacle is worthy enough to appear in the air but statue. Pyramids are *Gothic*; pots are modern *French*. Chimnies ought to be hid if not well adorned. No roof can have dignity enough to appear above a cornice but the circular: in private buildings it is excusable. The ancients affected flatness. In buildings where the view is sideways, as in streets, it is absolutely required that the composition should be square; intercolumniations equal; projections not great; the cornices unbroken, and every thing strait, equal, and uniform. Breaks in the cornice, projectures of the upright members, variety, inequality in the parts, various heights of the roof, serve only to confound the perspective and make it deformed; while the breaches and projections are cast upon one another and obscure all symmetry. In this sort of building there seems no proportion of length to the height; for a portico the longer the more beautiful, in infinitum; on the contrary, fronts require a proportion of the breadth to the height; higher than three times the breadth is indecent, and as ill to be above three times as broad as high. From this rule I except obelisks, pyramids, columns, such as Trajan's, &c., which seem rather single things than compositions; I except also long porticoes, though seen direct, where the eye, wandering over the same members, infinitely repeated, and not easily finding the bounds, makes no comparison of them with the height.”

“ Modern authors, who have treated of architecture, seem generally to have little more in view, but to set down the proportions of columns, architraves, and cornices, in the several orders as they are distinguished into Doric, Ionic, Corinthian, and Composite; and in these proportions, finding them in the ancient fabrics of the Greeks and Romans, (though more arbitrarily used than they care to acknowledge,) they have reduced them into rules, too strict and pedantic, and so as not to be transgressed without the crime of barbarity; though, in their own nature, they are but the *modes* and *fashions* of those ages wherein they were used; but because they were found in the great structures, (the ruins of which we now admire,) we think ourselves strictly obliged still to follow the fashion, though we can never attain to the grandeur of those *works*.”

CHAPTER VII.

The School of Wren.—His Successors.

IT may be proper to close this treatise with a few observations on the successors of Wren,—on the present taste for architecture,—and on the French school.

Hawkesmore, Vanbrugh, Gibbs, and others, of the same date, followed in his footsteps, proceeding upon the foundations laid by the revived or Palladian school. Hawkesmore was amongst the most successful pupils; he was so considered by his master, and he certainly surpassed his contemporary, Vanbrugh. It is observable, that after the age of Wren, something beyond the pitch of the art was attempted by his immediate successors, and amongst the foremost in this attempt was Hawkesmore. Something beyond the orders, something almost colossal appears to have been effected; but although there was a partial success, it seems as if something greater was intended than was, or indeed could be, attained. The works of Hawkesmore evince great beauties of conception, but mixed with so many caprices and so many defects, that he has perhaps never yet received his due share of credit.

The steeple, as applied to a building on the plan of a Grecian or Roman temple, is always absurd, and even Wren himself could not always rescue it from deserved and contemptuous criticism: but Hawkesmore appears to have been the only one who has ventured to place this steeple on one side of the building, as in St. George's, Bloomsbury; by this means avoiding at least the incongruity of making a steeple rise out of a temple. St. George's, Limehouse, and St. Mary's Wolnoth's, may be considered as the best specimen of his style; and the beautiful portico of St. Martin's in the Fields, now again about to see the light, is the masterpiece of Gibbs.

Amongst the succeeding class in the Palladian school, the most conspicuous were Ware, Sir William Chambers, and the Adams. Sir William Chambers's works are remarkable for their taste and elegance, and for a purer imitation of the antique of Italy. The Adams, with many defects chiefly from falling into the details of the Venetian school, produced works worthy of admiration, and were the first who investigated the Roman baths and the remains of the Roman villas, thus opening a new source of architectural combination, of which they often took great and judicious advantage. The Library at Luton is one of the most striking examples of this happy adaptation.

Without being entirely devoted to what is termed the Palladian school, or wishing to be supposed insensible to the beauty of the pure Grecian architecture, it must be admitted that the present taste for the pure Greek is carried too far. While we acknowledge the excellence of the great original, there is danger that some of the present professors may lose sight of the valuable additions which architecture has acquired from the labours of the Romans, and after them from the Revival school. These improvements are more adapted to utility than the Grecian architecture, which was besides deficient in some of the most important principles of magnificence, as for instance those obtained by the introduction of the arch, which opened a new field for grandeur, variety, and extent, and enabled the architect to cover a space beyond the power or combination of the Greeks to reach. It is almost impossible, by taking the very few existing examples of Grecian architecture (consisting only of sacred edifices) as models, to erect buildings calculated to serve the infinitely varied purposes of modern wants, without the risk of distortion and misapplication. The excellence of Greek architecture consisted in its principles of elegance and proportion, and what may be termed the detail, rather than its utility for the great purposes of construction. The shape of the Grecian temple admits of no change without the destruction of its beauty: add a side wing as a vestry, or let a tall spire shoot up above the low tympanum, and every principle of proportion and fitness is destroyed. Besides, the thing we produce has little resemblance to the original: the Grecian temple was designed to form a feature in the surrounding landscape, to be a vehicle for the exposition of sculpture, of the most exquisite and elaborate kind; it was radiant with gold, azure, and vermilion, laid on the pure marble; the delicate mouldings were to be seen under an unclouded sun, and to remain in a climate which conserved an unchanged appearance for ages. How different is the copy, cooped up in the smokes of a great city, composed of coarse materials, and without any aid of ornament, except a few mock stone vases or figures wretchedly executed!

The exclusive admiration of the Grecian architecture is becoming the cant of the day. It is impossible to agree with the dogmas of the professors in their exclusion of all the resources which the ingenuity of the moderns has furnished, and which the necessities of greater civilisation require: yet this different and less intolerant opinion may be entertained without any deficiency in admiration of the beautiful specimens of antiquity. This country is greatly indebted to the publications of Stuart and Revett, and of the Dillettanti Society, who first cultivated the true taste for Grecian antiquities, and laid accurate representations of them before the public. Stuart, whose original employment was that of painting fan mounts, but whose talents and industry enabled him to surmount all difficulties, conceived the happy idea of going to the original source of the beautiful in the arts; and from reading the Grecian history, figured to himself that there must remain at Athens a purer style than had been adopted either by the Romans or by the Revival school. He performed the journey on foot, with very slender resources, and joining company with Mr. Revett, produced the work which has redounded so much to the credit of himself and of his country. His project immediately excited the jealousy and with it the rivalry of the French, who despatched Le Roy in order to anticipate their labours, which he did by publishing his work at Paris long before the work of Stuart and Revett appeared. Le Roy however employed only twenty-one days in executing that which his rivals were engaged on for three years. The result might be easily foreseen. Le Roy's book soon sold for waste paper, and the *Athenian Antiquities* have since their publication in England been reprinted at Paris.

In mentioning the different great artists of the English school, we should do injustice in omitting the names of several distinguished amateur architects. Amongst the foremost of these stand Lord Pembroke, Lord Burlington, Lord Leicester, Dr. Aldriche, and Dr. Clarke, whose labours have tended so much to the advancement of the science, and whose works redound so much to their credit.

In comparing the French and English modern schools of architecture, Monsieur Le Grand, in his Essay, has very candidly admitted our superiority: "The English," he says, "adopted Palladio, whilst we have followed the orders of Vigniola; but with this difference;—they adopted the plans of Palladio entire, and accompanied by all their elegance and simplicity, whilst we have applied the orders of Vigniola to the most complex shapes in our buildings, and which we have overloaded with whimsical ornaments of the very worst taste; and the result of a comparison between the ancient architecture and ours is, that our own is complex, whilst that of the ancients was simple; theirs exhibits grand ideas in the most trifling edifices, whilst ours, in the execution of the greatest objects, are but a collection of small parts, and those united with difficulty, which is miscalled ingenuity."

The fact is, the French were ambitious of forming a new school: they were to invent new *orders* which were to be exclusively French; and their buildings in the age of Louis XIV. exhibit examples, in which all kinds of incongruous ornament are collected together without principle or meaning. To this succeeded what they conceived to be the pure Grecian taste; but as it was before the Grecian monuments had been studied or understood, this second manner was in truth very little more elegant or perfect than the former. They are scarcely ever successful in their attempts to adopt the styles of antiquity: although there is no nation so prone to affect a species of classical show, and none more ambitious of giving to the productions in art a classical air. This is observable particularly in their school of design, and in their drama; and yet it is impossible to contend that they have been successful. The difference of taste and manner between the French and the English, may, perhaps, be accounted for in some degree by their different modes of study. The French both in their studies and in their pursuits adopt more of the academic system than is followed in England; they work in bodies, and under the direction of the government, whilst our most laboured productions are the works of individuals, and consequently more likely to afford specimens of originality, it not of perfection. Without entirely denying the benefit of academies for the advancement of the arts, it is only from frequent experience of their failure through mismanagement, that the argument arises against increasing their number, or extending their influence.

J. JACKSON Sc.

THE LIFE
OF
MICHAEL ANGELO BUONAROTI.

CHAPTER I.

Introduction.—Michael Angelo's Early Life.

THERE is no period in the history of the world so fertile in striking and important events, as that which embraces the revival of letters, of the fine arts, and the discovery of printing, which followed in quick succession. It was towards the close of this time, that MICHAEL ANGELO BUONAROTI attained his greatest eminence.

It was mainly his genius that was

to call into new life the arts of painting and sculpture, and it was he, united with Bruneleschi and Bramante, who was destined to raise those splendid fabrics which rival the greatest monuments of ancient architecture.

In general, the incidents relating to men whose lives were devoted to study have been but imperfectly recorded, and it is often difficult to trace out the steps by which excellence was attained. The events, of the life of Michael Angelo have, however, been carefully noticed by Condivi and Vasari, who were his scholars and friends, and from their works the facts relating to this biography have been principally collected. If it should be considered that their works partake too much of panegyric, their apology may be sought in the greatness and universality of the genius of him whom they recorded, which seems to have dazzled all his contemporaries, and which even won for him the praises of Aretin, whose satire was called the scourge of princes, and of whom it was said, that he "spoke ill of every one save God."

The life of Michael Angelo is intimately connected with the history of the whole art of design; indeed the great excellence which he attained both as a painter, a sculptor, and an architect, cannot be sufficiently estimated except by considering the state of these arts at the time he commenced his career. In the notice of the life of Sir Christopher Wren, which has been already published, some few observations respecting the origin and progress of architecture were inserted, in order that the reader might be enabled the better to appreciate the merits of that great artist. In the present memoir, with a similar object, some few general remarks will be given respecting the origin and progress of painting and sculpture.

Michael Angelo Buonaroti was born in the year 1474; his family was ancient and illustrious; many of his ancestors had at different periods filled the highest offices in the Florentine republic. At the time of his birth, his father was governor of the castle of Chiusi and Caprèse, but he soon after retired to his patrimonial property near Florence, in the neighbourhood of which were some quarries. Michael Angelo was put to nurse with a wife of one of the masons, and used jestingly to attribute his excellence as a sculptor, to having imbibed with his milk a love for the chisels and mallet of his foster-father. His father, though of illustrious descent, being poor, the brothers of Michael Angelo devoted themselves to rural affairs, and the management of the family estate. He was placed at a grammar school in the neighbourhood: his progress, however, was not great, his bent for the fine arts, which early discovered itself, leading him to employ every moment he could snatch unobserved, in drawing whatever objects were at hand. The profession of an artist being at this period in little estimation, the pride of the father and uncle was shocked at the notion of the son's following the arts as a trade, and they therefore sought, not only by persuasion, but by chastisement, to check his dawning taste; he had however formed a friendship with a young artist, the pupil of Ghirlandaio, (then the most eminent painter in Italy,) who encouraged his taste by furnishing him with the drawings of his master as studies. The father finding it impossible to stem his son's inclinations, at last consented to his becoming a painter, and he was accordingly placed under Ghirlandaio. And it is noticed as a proof of the progress which he must have made, even at this period, that by the agreement which was entered into between the father and the painter, (which has been printed by Vasari,) the father was to receive a monthly remuneration for the services of his son.

Under this painter he early displayed great talent; one by one his fellow pupils were surpassed, and it was not long before he ventured even on criticising the designs of Ghirlandaio. One of these drawings, round which he had traced a bolder outline than that designed by his master, came into the possession of Michael Angelo's friend, Vasari, who in after life showed it to him: on seeing it, he is said to have lamented that there was so little difference between the first efforts of the boy, and the productions of his maturer age. A somewhat similar anecdote is told of Sir Joshua Reynolds.

Michael Angelo on another occasion gave proof of his rapid progress, by drawing, in the absence of his master, the scaffolding, and the pupils at work: when Ghirlandaio returned, he was so astonished at a performance which was at once indicative of great proficiency in drawing, and of a boldness of manner then unknown, that he proclaimed it the work of a master to be imitated, rather than the mere essay of a pupil. He continued to labour unceasingly at his profession, studying the best works which came within his reach; and a print of St. Anthony and the devil, supposed to be by Martin Schœn, (one of the earliest engravers,) is mentioned as having been copied by him with great care, he having painted the different objects in the composition (such as fish, animals, &c.) with singular accuracy, and, wherever he could procure the subjects represented, painted them from nature. He also at this time made several imitations of the drawings of the older masters, which were so well executed that the connoisseurs of the day being deceived, purchased them as the productions of those whose works they professed to be.

After the darkness and ignorance of the middle ages, Dante, followed by Petrarch and Boccaccio, (each choosing a new and untried field,) had, during a rapid and brilliant career, succeeded in effecting the perfection and refinement of the Italian language, and the introduction of the study of the ancient classics; yet their disciples were few, and none sustained the reputation of their masters. Petrarch died in 1374, Boccaccio in the year following; and a full century elapsed without producing any literary work that can be ranked with their compositions. For a time, a general degradation of letters, and a debasement of the Italian language took place. About the middle of the fifteenth century the study of literature was again revived, and the fine arts began to be cultivated, principally under Cosmo de Medici, who, after having established his authority in Florence, devoted the latter part of his life to the encouragement of philosophy and literature. He was succeeded by his son Piero, who was prevented by disease from making any great progress in the path pointed out by his father;—it was principally to Lorenzo de Medici, (the eldest son of Piero,) a man possessed of an original and versatile genius, that the praise of having restored to literature and the fine arts their ancient honours, is due. "And whilst the study of polite literature was thus emerging from its state of torpor, the other sciences felt the effects of the same invigorating beam, and the city of Florence, like a sheltered garden in the opening spring, re-echoed with the earliest sounds of returning animation."*

Though, as will be seen in the sequel, it was the fate of Michael Angelo in after life to receive little help from the patronage of the great; yet in his youth he was eminently fortunate in having Lorenzo de Medici (the great patron of literature and the fine arts) for his friend and adviser.

At the time Michael Angelo began to study, Lorenzo was in the plenitude of his power, and he devoted a portion of that time (the whole of which was occupied in the advancement of the greatness of his country) to the revival of the arts of design. Having collected, for this purpose, in his garden some of the finest specimens of ancient sculpture, and the best paintings of the time; he inquired of Ghirlandaio the names of the most promising of his pupils, in order that they might be allowed to study the various objects in his collection, so as to form their taste from these fine examples. Michael Angelo was one of those who were recommended, and it seems that some rising jealousy on the part of the master the more inclined him to this, as he was glad to rid himself of one who, he felt, was early destined to become his rival in the art of painting.

It was not long before his talents were noticed by Lorenzo, whom knowledge as well as inclination fitted to become a judicious patron. It is said by Vasari, that Michael Angelo having begged a piece of marble, from some men employed in the garden, carved out of it a mask of a satyr, the design of which was borrowed from an antique fragment. It was seen, and admired by his patron, who, however, jokingly remarked, that he had committed an error, in putting a complete set of teeth in the mouth of an old man. By the next day, however, he found this fault repaired, for the artist had dexterously broken away one of the front teeth, and drilled a hole in its place, to represent the cavity which would have been made by its falling out. Lorenzo, struck with his rising talents, his eagerness and docility, sent for his father, and desired that he might be permitted to take him entirely under his protection, to which the father reluctantly consented. After this he took up his residence in the palace, and a competent salary was allowed him; and Lorenzo, not content with patronizing the son, bestowed an office of profit on the father, whose circumstances were declining.

Michael Angelo was received on terms of intimacy and freedom by his patron, at whose table he formed an acquaintance with the learned men of the time, by whom Lorenzo was surrounded. During this period he obtained the friendship of Politian, the most accomplished scholar of his age, by whose advice he executed the celebrated small bas relief of the battle of Hercules and the Centaurs, which at once established his fame as a great artist. During the time of his studying in the garden of Lorenzo, Torrigiano, one of his fellow students, (who afterwards executed in England the tomb of Henry VII.) in a fit of envy at his rising greatness, or on some quarrel, struck him so violent a blow on the nose with a mallet, that he bore the mark through life. The laws of those times not being very favourable to the liberty of the subject, Torrigiano was banished the state for this attack on his rival's person.

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* Roscoe.

On the death of Lorenzo, Michael Angelo continued for some short time under the patronage of his degenerate successor, Piero de Medici, who was incapable of appreciating his talents, and therefore unfit to be the patron of one so eminent. During the winter, he was employed by his unworthy and capricious master, to build up in the court-yard of his palace, a large statue of snow: and was also compelled to keep company with the duke's favourite valet; and Piero used to boast that he had in his service, the most eminent artist, and the fleetest running footman of the day. About this time Michael Angelo executed in bronze, a colossal statue of Hercules, which, it is said, was sent into France; but it is unknown whether it now exists. He also executed a crucifixion, in wood, for the church of a convent in Florence.

Michael Angelo was early impressed with the conviction, that the human figure could not be truly represented without an accurate acquaintance with its parts, and a knowledge of the several organs which contribute to its functions, whether the subject were in rest or in action. It was during this period that he availed himself of the assistance of the superior of the convent, for whom he had executed the crucifixion, to acquire that intimate knowledge of anatomy, for which his works are so distinguished, and which he is considered in general to have displayed too ostentatiously.

It is proposed here, in accordance with the plan already noticed, to break off the narrative, for the purpose of briefly considering the ORIGIN and PROGRESS of the arts of sculpture and painting among the ancients, and the history of their revival among the moderns. Without entering somewhat on these points, the mere detail of the events of the life of Michael Angelo would excite little interest. The chief pleasure or information to be afforded by it, must in fact arise from a knowledge of the principles relating to the fine arts,—from considering the estimation in which they have been held by all polished nations,—the assistance they afforded to the gradual civilization of mankind,—and the various difficulties opposed to the attainment of excellence by those who professed them.

CHAPTER II.

Of the Origin and Progress of Ancient Sculpture and Painting.

I. ANCIENT SCULPTURE.

THE art of sculpture appears to have been cultivated in the early ages of most nations. It was, however, chiefly employed by them in the service of religion, or in the symbolical representations of divine attributes; this is abundantly testified by the remains of art in Egypt, Ethiopia, India, Persia, and ancient Greece.

The origin of sculpture in all nations may be traced to the desire to perpetuate the memory of extraordinary events or persons, or to do honour to gods or heroes; but though the art of design may have owed its beginning to necessity, yet its cultivation and improvement will in all cases be traced to civilization and refinement.

With regard to the specimens of sculpture by the Egyptians, amongst which are the most ancient monuments now remaining, Mr. Flaxman observes, that the forms of the hands are gross, and have no anatomical detail of parts, and are totally deficient in the grace of motion; but that, notwithstanding their defects, we shall find in them some excellent examples of the art; that the principal forms of the bodies and limbs are expressed with a fleshy roundness, and that in the female figures, parts often possess considerable elegance and beauty. The forms of the female face have much the same outline, and indicate the same progression towards beauty, which we see in the early Greek statues, and like them are without variety of character; though their simplicity of conception, breadth of parts, and occasional beauty of form, have been praised by the best judges ancient and modern. The principal defects of their works arise from their want of anatomical, mechanical, and geometrical science.

The Egyptian arts were in different progressive states of improvement from before the time of Moses down to the invasion and subjection of the country by Cambyses, a period of about 1000 years. The arts of Greece, from their rudest beginnings, rose to perfection during the reign of Alexander, that is in about 900 years. Winkelman, who has written much on ancient art, marks what he conceives to be three distinct epochs in the style of Egyptian sculpture, and his editor, the Abbate Fea, has spread these out into five. It would be foreign, however, to the object of these observations, here to enter into these antiquarian disquisitions. Much speculation has been employed to arrive at the reason why a nation so superior to others in science, should have made so little improvement in the arts. The causes assigned for it are numerous. By some it is ascribed to the want of beautiful forms, the ignorance of anatomy, and the absence of public athletic games, as the chief reasons. It is, perhaps, sufficient to account for this by stating, that in Egypt, professions were hereditary, that the son was compelled to follow the father's occupation, and that the arts were studied solely by slaves, who were classed in the lowest rank, and never allowed to rise above it; circumstances under which little else than mere mechanical excellence could be expected. In Greece, on the contrary, the arts were emphatically considered *Liberal*, because none but freed men could study them; they were pursued by the noblest persons, and were used to celebrate and excite virtue and excellence, and not, as in Egypt, merely to pile up ponderous monuments to rulers.

Though the Egyptians attained but an inferior degree of excellence in the arts, yet they possessed the power of working with great delicacy in the hardest granite and porphyry. What were the means by which they were enabled to do this have never been discovered; the finest tempered tools of modern times are destroyed after five or six strokes on those substances, out of which they finished immense statues.

Mr. Flaxman supposes that it was not till after Hippocrates had made his researches in anatomy, that the minute anatomical parts were expressed in the Grecian statues; and remarks, that Pliny notices the sculptor Leontinus as first expressing tendons and veins;[*] and that, in the same manner, all the improvements of the art of design followed the great improvements of science; that it was not till after Euclid had formed his collection of problems, that we find the utmost variety given by sculptors to the positions and actions; and that Greek sculpture can hardly be considered to have risen to excellence, until anatomy, geometry, and numbers, had enabled the artist to determine in his drawing, proportion and motion; as it must be evident that the human figure can only be represented in the same degree as it is understood. From the want of the same progressive improvement in optics, we find the best ancient pictures and basso relievos always limited and defective in what is termed the foreshortenings of the figure.

The history of Greek sculpture has been divided generally into four principal periods, each distinguished by striking peculiarities of style, or mode of treatment; the first embraces all that uncertain age of which our only knowledge is the tradition handed down by ancient writers, to the period of the Æginetan style or school, that is to 600 or 550 B.C. This may be termed the—

I. Archaic Period.

In this period are to be classed those works described by Pausanias and Pliny by the terms *stiff* or *straight*, partaking more or less of the original terminal statues in which the head and feet only were expressed, the arms and legs being united to the block; and also the remains of sculpture discovered amongst the ruins of a temple in the island of Ægina, now at Munich. The second period is the—

II. Phidian,

and will reach from the Æginetan down to the sublime style of sculpture, which was brought to perfection by Phidias and his contemporaries, 600 to 450 B.C. when those works of art were produced

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[*] The words of Pliny are, *Hic primus nervos e venas expressit, capillumque diligentius.*

"whose mimic flesh seems yielding to the touch! whose balance alarms with the expectation of movement!" The third period is the—

III. Praxitelian and Lysippic Style,

and is distinguished by the introduction of a richer and softer style of execution, effected by Praxiteles, and varied in some respects by Lysippus, and may be brought as low down as 250 to 200 b. c.

IV. Decline.

The fourth, and last, is the decline of sculpture in Greece under bad imitators and worse innovators; when grandeur was lost sight of in detail, when manner took place of style, and simplicity and general grace were superseded by individuality and littleness.[*]

We have extracted the foregoing short arrangement of the æras of Grecian sculpture, but our limits do not admit of any attempt to trace its progress through the successive improvements, from the rude but spirited works of Dædalus, mentioned by Pausanias, to the meridian splendour of the times of Phidias and Praxiteles.

Sculpture has been said, to "start at once into life and grace at the Promethean touch of Phidias; and that twenty centuries have not only added nothing to this department of the fine arts, but that, contrary to all reasonable expectation, it has receded from the point of excellence which the first master had attained, and that like the fabulous Minerva, (whose story the eloquent Phidias recorded,) sculpture issued from the brain of her parent in full perfection, and the hour of her birth was also that of her maturity."

That twenty centuries have added nothing to the perfection which was attained by Phidias and Praxiteles and those of their times, must be admitted: the works of the intervening ages afford sufficient evidence of this; but though this part of the proposition be true, it is equally true that Grecian art had its infancy, and that, like all else in nature, the developement of the human faculties in the attainment of excellence was gradual, and that it was by a succession of improvements from age to age, that sculpture attained that unsurpassable excellence which it reached in the time of Phidias.

In accordance with what has been stated with regard to the perfection of execution, keeping pace with, or rather following the discoveries in anatomy[*] and geometry, it may also be observed that the beauty and perfection of Grecian art, of the school of Phidias, accompanied the great moral and intellectual improvement of the times: and art was most perfect when Æschylus, Sophocles, and Euripides produced their tragic poems, and Socrates and Plato, and the great Grecian statesmen, by their writings and example, improved the moral and political state of mankind.

Another cause of the advancement and cultivation of art, was the estimation in which it was held throughout Greece; the public authorities took a deep interest in its perfection. At Thebes, as well as at Athens, there existed regulations both for the protection and the encouragement of the professors, and there were laws both penal and pecuniary against those whose works fell short of the requisite beauty of the object attempted, and against the execution of subjects which were either common or regarded as improper; the authors of which were treated with contempt and derision.

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[*] Ency. Metrop. "Sculpture."

[*] By most of the writers on Greek sculpture the improved knowledge of anatomy is stated as one of the causes of its perfection: this, however, is denied by two writers both distinguished for their skill in anatomy, and for great practical knowledge of the arts. "It has long been a matter of keen debate, whether the Greeks were acquainted with anatomy, but that if it had been much known to them their knowledge would not have remained a subject of speculation, we should have had evidence of it from their works; but, on the contrary, we find Hippocrates spending his time in idle prognostics, and dissecting apes to discover the seat of the bile. If more anatomy had been known than could be seen through the skin, or discovered from a skeleton found on the sea-shore, it would not have been left an imperfect and nearly unknown science. The ancients had no opportunity of becoming acquainted with the formation of the human body except from what might be the result of accident; after death the body was burnt, and the funeral urn contained its ashes.

"The ancients, however, kept records of the perfections of the human body, and these consisted in the aptitude for exercises. At the Olympian Games statues were made of those who had been often victors, when the exact size, the peculiar forms, all the beauties, and even the very defects of their bodies were carefully preserved that they might serve as models of manly strength, of swiftness, and prowess. One striking part of their excellence is the total avoiding of all exaggerated expression, caricatured, violent, or strong action, which, instead of bespeaking the sympathy of the beholder, only weakens the effect, producing disgust rather than pleasure. If they had not anatomy they had, perhaps, a better substitute, the continued means of observing the most perfect specimens of the living body in action, and of this they made the best use."—Mr. John Bell's Travels in Italy.

Mr. Charles Bell in his Essays, says, "Although it is certain that the Greeks had not made any proficiency in anatomy, but by minute and continued observation of the figure under all the circumstances and situations in which it was to be represented they obtained a just knowledge of it; yet, it must be obvious, that the power of representing expression accurately must be materially aided by the accurate knowledge which is to be obtained by becoming familiar with the component parts of the figure, and the characteristic differences which mark and distinguish the countenance and the general appearance of the body in situations interesting to the painter and statuary. The characters of infancy, youth, and age; the peculiarities of sickness or of robust health; the contrast of manly and muscular strength with feminine delicacy; the appearance of disease, pain, or death, all must be better learnt and understood from the actual knowledge of the muscles of expression, than from mere individual observation."

The rank and consideration accorded to the Greek artists tended much to the encouragement of art. Far from being considered as mere mercenary tradesmen, they were esteemed persons of distinction, and respected as men endowed with divine genius, enriched by study, polished by their intercourse with the world; they were placed even above philosophers, and considered amongst the first persons of the state, and partook, in the public ceremonies, of that immortality which they bestowed on others by their works. It was not unfrequently that their statues were placed side by side with those of great kings and heroes. As a proof of the estimation of the arts of painting and sculpture amongst the Greeks, it may be observed, that Plato studied painting—and Aristotle may be reckoned amongst the patrons of the art, as well as his pupil Alexander.

Many provinces of art have since been cultivated by amateurs and persons of refined education, but the mass have ever been regardless of the master-pieces of the arts of design. This was not so amongst the Greek nations. Art in all its branches and influences grew up in the most intimate connexion with the whole population, was cultivated by the whole, and formed an integral part of public education. The knowledge of the art of design was an essential accomplishment amongst all the well-educated Greeks. The drawing of the human figure on tables of wood as large as life was an academic exercise, by which an exact knowledge of proportion, grace, and freedom, was obtained unknown in our modern schools. Such was the extreme and general admiration for the finer works of art, that the people constantly resorted to those places which were possessed of any rare or great work of art, as, for instance, to Thespiæ, where the Eros of Praxiteles was placed. As a proof of confidence in the respect paid by all to the professors of the arts, it may be remarked, that when Demetrius besieged Rhodes Protogenes was finishing a picture: on his indifference being remarked, he observed, "Demetrius wars with the Rhodians, not with the arts!" Again, the manners of the Greeks were peculiarly adapted to the furtherance of the study of the arts. Every ceremony of their poetic religion, the rites observed at their marriages, their funeral processions, and public games, were so many occasions for calling forth talent, and presenting fine models and subjects for imitation.

"Another great cause of their advancement, was the expedition of Xerxes, which, by its failure, discovered to the Athenians the wealth of Asia, while it discovered the weakness of the invaders. It was the custom in Greece to dedicate a tenth of all spoils gained in battle to the service of the immortal gods, and a tenth of that obtained from the Persians was appropriated to this service. Temples were erected and embellished, far surpassing in beauty and magnificence those which had been demolished; and, happily for the advancement of art, the opportunities this application of wealth afforded for its improvement, were met by a greater quantity of talent in the respective professions of architecture and sculpture than had ever before appeared. This ample employment, and the high object to which their works were destined—to honour the gods and commemorate the glory of their country—excited a spirit of honourable emulation in the artists, which called forth all their powers, and led to that perfection in art which even at this remote period we contemplate with the highest admiration."*

Phidias had the advantage of living at Athens during the enlightened administration of Pericles, and being held in great esteem by him, was consulted on all the works that were undertaken for the embellishment of the city, and was particularly engaged in the superintendence and decoration of the Parthenon, or temple of Minerva. His superior genius, in addition to his knowledge of painting, (which he practised previously to commencing sculpture,) gave a grandeur to his compositions, and a grace to his groups, a softness to the flesh, and a flow to draperies unknown to his predecessors; the character of whose figures was stiff rather than dignified, their forms meagre or turgid, the folds of drapery parallel, poor, and resembling geometrical lines, rather than the simple but ever varying appearance of nature.

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* Ency. Metrop., "Sculpture," p. 448.

Within the temple of Minerva in the Acropolis at Athens, stood the statue of the goddess, which was thirty-nine feet high, made by Phidias of ivory and gold, holding a victory of six feet high in her right hand, and various other ornaments.[*] His chief work was the statue of Jupiter, at Elis, sitting on his throne, which was wonderfully enriched with ornament and basso relievos: the height of this figure if upright would be sixty feet[†]; the statue was of ivory, and enriched with golden ornaments and precious stones, and justly esteemed one of the seven wonders of the world. None of the greater works of Phidias remain, though the sculptures of the pediments, the metopes,[‡] and portions of the frieze of the Parthenon, forming the chief part of the Elgin marbles, (which were undoubtedly the works of Phidias and his pupils,) are sufficient proofs of the justness of the universal praise bestowed on the founder of the grandest style of Grecian art.

The value put on art, which was excessive, was another cause of its perfection; being an excitement to excellence from the demand. The citizens of Cnidos refused to part with the Venus of Phidias to king Nicomedes, though he offered in return to release them from an immense debt which was due to him. When Phidias proposed to make the great statue of Minerva of marble, on account of the costliness of the ivory, the Athenian authorities told him not to mind greater cost for the attainment of greater beauty.

Though the time at which sculpture arrived at perfection was the age of Phidias, Pliny's chronological catalogue of the most celebrated Greek artists continues 160 years later, subsequent to which time the Laocoon, and several of the finest groups and statues, it is supposed, were executed. Nor can we believe from the admirable busts and statues of the imperial families still remaining, that sculpture began to lose much of its graces, at least in the less ideal branch of the art, until the reign of Antoninus. Indeed, so strong was the stamina of Grecian genius in the arts of design, that after the time of the Iconoclasts in the fifth and sixth centuries, (when the noblest works were destroyed,) and until Constantinople was taken by the Turks in the fifteenth century, the Greeks executed small works of considerable beauty, as may be seen in the carved diptychs.[*]

The Etruscan and Sicilian sculpture, (as to the origin of which so much has been written,) must be classed as the work of Greek colonists or their disciples. The principal schools of Greek sculpture were Athens, Thebes, and Rhodes; but it does not appear that any one state was devoid of a taste for the beautiful:—from Rhodes alone the Romans brought away 3000 statues.

It seems to be admitted by all, that the Greeks in their statues attained that which is considered as perfection in the representation of beauty; and, as it were, became at once the arbiters of a standard of form. Various causes have been assigned for this superiority. Some have attributed it to the fineness of the climate, yet other countries had a climate at least equally good; some assign it to the beauty of the people; others to a peculiar form of government; whilst, on the other hand, others have entered into long discussions, to prove that the climate of that part of Greece where the arts most flourished was bad; that the Athenians, at least, were far from being celebrated for their beauty. In proof of one of these objections, it may be stated, Cicero remarks that few of the youths of Athens were really handsome. With regard to the merits of a peculiar form of government, it is certain that the arts equally flourished in Greece under very opposite governments, and in the most powerful and the weakest states. Some, or perhaps all, these causes may have assisted though they alone could not have produced the results contended for. The principal cause was that the Greeks were more refined than any nation which had before existed, and the same cause which led to their excellence in poetry, ethics, and political science, led to their superiority in the arts. Another reason was their peculiar admiration and study of beauty, hereafter to be noticed; and as religion was the first mover of their art, it followed that they should endeavour to invest their gods with the most perfect form; and they were, therefore, peculiarly led to a complete and intellectual study of its elements and constitution. Again, it should also be remarked, that at the period when the arts were at the greatest perfection, civilization had just arrived at that state in which the manners of men are polished but yet natural, and consequently their attitudes and gestures were expressive and emphatical without being coarse. Their style of dress also was much better adapted to display the natural form of the body, without constraining the motion, and destroying the shape, as in more recent periods; thus perpetually affording fine models for the artist.

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[*] The great ivory statues, according to Aristotle, were made of stone covered with ivory, so fitted together as to appear one mass of ivory, which has much the tint and appearance of flesh.

[†] The colossal sphinx near the great pyramid, rises twenty-five feet, although it is nearly buried up to the throat. The sitting statues of Memnon, the mother and son of Osymandyas, at Thebes, are each fifty-eight feet high; and the clenched hand, in red granite, in the British Museum, belonged to a statue sixty-five feet high. The colossus of the sun at Rhodes, is mentioned by Pliny to have been 105 feet, and was thrown down by an earthquake after standing fifty-six years.

[‡] See note p. 12.

[*] Several of the diptychs preserved in the various museums of antiquities, afford some curious specimens of the art of painting and carving, during the middle ages.

The diptychs were composed of small tablets of wood or ivory. They were used by the consuls, who, on their election, inscribed their names in them, the date of their election, the names of the principal magistrates, and other memoranda; these were presented by the consuls to the officers of state and their friends, in the same manner as pocket-books are now given on the beginning of a new-year, which, probably, is a continuation of the ancient custom.—The diptych was adopted by the christian bishops, and was used as a species of ecclesiastical register for different purposes; the exterior of the tablets was usually ornamented with carvings or paintings of scriptural subjects. When it was composed of three tablets it was called a *triptych*; these tablets were usually placed on the altar, and from them, altar-pieces with folding wings turning over the middle portions were originally derived.

As in discussing the subjects relating to art it is necessary to use certain terms, with respect to the meaning of which much difficulty and some difference of opinion exist, we shall give a definition of those which are in more general use. Indeed, unless the sense in which they are used by the author is defined, the reader and the writer must often arrive at different conclusions. Of various writers on art, perhaps none has been so generally successful in defining the terms in use as Mr. Fuseli;* we shall adopt his explanation of a few which are most important to be understood.

Nature he states to be as the general permanent principle of visible objects not disfigured by accident, nor distempered by disease, not modified by fashion or local habits. Nature is a collective idea, and though its essence exist in each individual of the species, it can never in its perfection inhabit a single object.

"With respect to *beauty* I do not mean to perplex with abstract ideas, and the romantic reveries of Platonic philosophy, or to inquire whether it be the result of a simple or a complex principle. As a local idea, beauty is a despotic princess, and subject to the anarchies of despotism; enthroned to-day, dethroned to-morrow. The beauty we acknowledge is that harmonious whole of the human frame, that unison of parts to one end, which enchants us;—the result of the standard set by the great masters of our arts, the ancients, and confirmed by the submissive verdict of modern imitation.

"By *grace* I mean that artless balance of motion and repose sprung from character, founded on propriety of character, which neither falls short of the demands nor overleaps the modesty of nature. Applied to execution it means that dexterous power, which hides the means by which it was attained, the difficulties it has conquered.

"When we say *taste*, we mean not crudely the knowledge of what is right in art: taste estimates the degrees of excellence, and by comparison proceeds from justness to refinement. We generally confound, when speaking of art, *copy* with *imitation*, though essentially different in operation and meaning. Precision of eye, and obedience of hand are the requisites of the former, without the least pretence to choice, what to select, what to reject; whilst choice directed by judgment or taste, constitutes the essence of imitation, and alone can raise the most dexterous copyist to the noble rank of an artist. The imitation of the ancients was *essential, characteristic, ideal.* The first cleared nature of accident, defect, and excrescence; the second formed the stamen which connects character with the central form; the third raised the whole and the parts to the highest degree of unison.

"No word has been more indiscriminately confounded than *genius;*—by genius, I mean that power which enlarges the circle of human knowledge, which discovers new materials in nature, or combines knowledge with novelty, whilst talent arranges, cultivates, polishes the discoveries of genius."

Without attempting to enter into, or even examine the metaphysical discussions relating to beauty, which have occupied so many writers, it will be interesting, in addition to Mr. Fuseli's definition, to examine what were the notions of Mr. Flaxman on this point, and the consideration of these will in some measure lead to the elucidation of the reasons of the superiority attained by the Greeks.

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* Lecture I.

He defines beauty* of the human person as goodness or virtue, and wisdom in a human form best suited to their expression and exertions. "Whatever of beauty or perfection becomes an object of contemplation to our minds, whether it be purely mental, or perceived through the medium of our senses, must be derived from the beautiful and perfect itself, and may be traced back towards its divine origin; however diversified, it proceeds from this source, and directs us where to seek the principles and perfection of all science and art, of all things metaphysical, physical, and moral, which, by their mutual connexion and harmony, declare their common relation and origin: therefore, what is called *beauty* in the arts of sculpture and painting, must be sought for in its principles, metaphysical, physical, and moral."

It is curious also to examine what were the principles on this subject of the Greek philosophers, at the time when the arts in Greece attained their greatest excellence. In the dialogue between Socrates and the sculptor Clito, (*Xenophon's Memorabilia*,) Socrates concludes, "that statuary must represent the actions of the soul by form;" and in the former part of the same dialogue, Parrhasius and Socrates agree that the good and evil qualities of the soul may be represented in the figures of man by painting. Plato, in his Dialogues, reasons to the same purpose, and declares that the good and the beautiful are one. Aristotle observes that beauty is order or grandeur; order supposes symmetry, fitness, and harmony; and in grandeur are comprised simplicity, unity, and majesty; and Aristotle concurs with Plato in acknowledging the relation between beauty and goodness, evil and deformity; and it appears to have been one of the great objects of all the ancient schools, to trace and demonstrate, not only the likeness, but the identity of beauty and goodness. So great and so universal was the admiration of beauty of person, that prizes were instituted for those who excelled in beauty and regularity of form, and the priests of some of the most celebrated temples were selected from the youths to whom prizes for beauty had been awarded. The Spartan prayer, "Give us what is good and what is beautiful," is another proof of the general sentiment on this subject.

The Greeks appear to have delighted more in imitation than in creation or action, which, perhaps, was the chief cause of the perfection they arrived at in the imitation of nature, without attempting to go too far in the representation of more than beauty of form; again the physical beauty of the race, exposed to view by gymnastic and warlike exercises, gave a right direction to the study of sculpture, and it was the conviction that the beauty of art consists more in proportion, harmony, and regularity, than in an excessive expression of any passion or action, or a superabundance of ornament, that led them to the right path, and preserved them from leaving it.

As sculpture owed its early origin to religious worship, and to the formation of images of the Deity, the peculiar feelings of the Greeks on those points materially assisted them in the attainment of excellence.

Both in the developement of modes of religion peculiar to the Dorians, and in the adoption and alteration of those of other nations, an ideal tendency may be perceived, which considered the Deity not so much in reference to the works or objects of nature as to the actions and thoughts of men; consequently their religion had little of mysticism, which belongs rather to elementary worships, but the gods assume a more human and heroic form, although not so much as in epic poetry: hence the piety of the Doric race had a peculiar and energetic character, as their notions of the gods were clear, distinct, and personal.*

Whatever may be the truth or merit of these theories, yet it must be obvious that the various causes we have stated led to the attentive, intimate, and minute study of particular character, of beauty of form and expression; and the result was the attainment of excellence in its actual representation, and the production of those specimens of art which have never yet been surpassed, or even rivalled; but which only excel nature by bringing together such an assemblage of beautiful parts as nature never was known to bestow on one object.

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* See the article "Beauty," in Rees's Encyclopedia, which article, and that on sculpture, were written by Mr. Flaxman.

* Dorians, Müller, b. ii. c. xi. p. 9.

In arranging the different styles of the beauty of Greek sculpture, Mr. Flaxman observes, that the ancients assigned the first class of beauty to the superior divinities, the second to heroes, and the third to fauns.

Of the superior gods, the sons of Saturn possess the rank of *sublimity* of beauty. In the fine head of Jupiter, in the pope's collection, the hair rises from the forehead, and descends in abundant flowing locks on each side of his face and neck to the shoulders, his forehead is muscular, with an expression of great strength, his nose and cheek are correspondent, his eyes express benevolence, his wise and serious brow, his placid countenance and full beard inspire reverence and awe; his figure is that of the *mightiest* of the superior gods,—his right arm moderately raised with his thunderbolt, or leaning on his sceptre, presents the habitual art of governing the universe. Winkelman has judiciously observed that the Greek sculptors preserved the family resemblance in the Saturnian race, with as much exactness as if they had been real portraits; therefore Jupiter's brothers strongly partake of the same character, except that Neptune's countenance is more severe, and his hair more disturbed. Pluto's hair, hanging over his forehead, gives a gloomy cast to his countenance, which is increased by his more open and starting eye.

In the youthful beauty of Apollo, Bacchus, and Mercury, the same benevolence and wisdom are expressed, modified by their peculiar characteristics and offices;—Apollo is light and strong in his make; Bacchus more soft and luxurious; and Mercury more athletic. The peculiarity of Hercules is magnanimity, and unconquerable strength.

The heroes have a more simple character throughout, approaching nearer to common nature. The fauns may be ranged in the lowest class of beauty expressed in the human figure: although their persons are youthful and rather handsome, their proportions are shorter than those of the classes above named, and sometimes their muscles are turgid and tendinous, accommodated to their sylvan habits and activity; their rounded faces have a portion of rustic good nature; but their united eye-brows, eyes placed diagonally to the nose, small hollowed noses, and grinning mouths, express some mixture of savage, servile, and mischievous dispositions.

The most engaging and captivating species of beauty exists in the female sex, this was expressed in perfection by the Greeks in their superior classes of statues; the large eye and full under-lip of Juno, gave an air of haughtiness to her countenance, her limbs are round, and her figure majestic. Minerva's figure partakes of Juno's majesty; but her face is not so full, and has an expression of abstracted wisdom. Venus is represented as an assemblage of female charms, her form is delicate, perfect, and elegant in the highest degree, her motion graceful, and her countenance expressive of love and sweetness:—a reference to the casts in this country, and the prints of the most celebrated ancient statues will convince the reader of the skill and general accuracy of these remarks of Mr. Flaxman.

BASSO RELIEVOS.

In treating of sculpture, those works which are arranged under the class of *basso relievos*, or low relief, must not be omitted; this is the representation of figures on a back ground, in such a manner that no part of them is detached from it: *alto relievo*, or high relief, is a modification of the same class, and has the larger parts attached to the back ground, whilst the smaller stand out free from it; to these two styles may be added a third species of relief, which was obtained by cutting or sinking, making the object represented below the plane of the original ground, a mode of working scarcely ever employed in modern times, but of which many specimens may be seen in Egyptian sculpture.

Basso relievo, although an important province of sculpture, is in a particular manner allied to architecture. As every considerable work of this kind must be made for the pediment, frieze, or panel of a building or architectural form, and, therefore, the general shape of the ground, the distribution and proportion of the figures must be subservient to the surrounding and containing parts, in order that they may produce a beautiful and perfect whole.

Basso relievo was originally used as pictorial writing, similar to, or the same as, hieroglyphics, and as such is common to all nations in the earliest infancy of the arts; but it was reserved to the Greeks to perfect this, as well as the other arts of design. The *basso relievos* which were used in filling the friezes and the tympanums, and were placed in the metopes of the great temples, executed during the time of Phidias and the other great artists, show that the art of sculpture in this department quite equalled that which was devoted to the production of entire statues: we have, fortunately, an opportunity of ascertaining the truth of this from the originals of the frieze and metopes brought from the Parthenon at Athens.[*] Some of the works of the earliest sculptors, on the revival of the arts in Italy, are in this style, and many of them are of great interest.

Donatello executed bronze basso relievos on the two pulpits of St. Lorenzo, at Florence, the two principal subjects of which, are the crucifixion and interment of Christ, in which the expression is admirable; but the work of this description that obtained the highest reputation, was the bronze gate, executed by Lorenzo Ghiberti, for the baptistery of St. John at Florence, consisting of ten compartments, filled with subjects from the Old Testament; the whole is of gilt bronze, and it was said by Michael Angelo "to deserve to be the gate of paradise:" from this period down to modern times, little which was excellent was executed in this style. It may be considered the pride of England, to possess the beautiful designs of Flaxman, from Homer, Hesiod, Dante, and Æschylus, rivalling in beauty and grandeur of composition the works of the best time of ancient art. But if we pride ourselves on this possession, it must excite regret and some feeling akin to shame, when we recollect, that notwithstanding the great sums expended in the patronage of art in this country, he is gone to his grave, without ever having, during a long life, been commissioned to execute any one of those fine compositions in marble. Thorwaldsen, the Dane, now at Rome, should be noticed as having been very successful in his designs and works in this branch of the art.

Various materials appear to have been used by the ancients, and even during the best period of art, in the formation of the same statue, particularly in colossal works. This mixture, however, is totally disapproved of by modern taste.

Exactness of imitation is more to be sought in sculpture than in painting; because, unassisted by colour, it is necessary that the requisites of imitation to the extent of form, should be nearly, if not entirely, complete, in order to create any conception of merit; but as the pleasure derived from sculpture is unconnected with deception, any attempt at colouring statues, or any artifice, such as adding real dresses, &c. must be offensive to a cultivated taste. That which is known to be mere trick, must lose all pleasure, when the surprise created by the deception is past. The Greeks, however, often composed one figure of different materials, such as brass and marble, ivory and gold, but not, probably, for the purpose of actual deception, or greater exactitude of imitation; they also, occasionally, put gems or silver in the place of the eyes. There are also not wanting authorities for supposing that they occasionally coloured their marble statues, to imitate life, but it is hardly possible to conceive with any advantage; though Mr. Flaxman, in his lectures, has supposed that in some cases a particularly beneficial effect might have been so produced.

There was a statue of Augustus in amber, and at the celebration of *funeralia*, as those of Sylla, at public exhibitions, or on other extraordinary occasions, statues are mentioned as having been made of aromatic gums, and materials of the most combustible nature; and amongst the odd conceits of the ancient artists, may be mentioned a statue of the all-powerful goddess of love and beauty made of loadstone, which attracted a Mars of iron! The combination of different materials for the purpose of producing a variety of colours, either of drapery or ornaments, was termed polychromic (many coloured) sculpture, and those works which were composed of a variety of stone or marble, were, in like manner, called polylithic (many stones).*

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[*] The chief of the marbles in the British Museum called the Elgin marbles, formed part of the ornaments of the temple of Minerva, or Parthenon, in the Acropolis at Athens, and afford an example of the judicious use of the three different species of sculpture. This temple consisted of the cella, or the interior space included within the wall of the temple; a row of side columns, and eight columns at each end; in the porticos the frieze of the entablature is composed of Doric architectural ornaments called *triglyphs*, and of sculptured ornaments called *metopes*, the triglyph being over the centre of each column, and of each intercolumniation, and the metopes occupying the intervals, representing, in *high* relief, the combat of the Lapithæ and the Centaurs. The frieze of the cella was an uninterrupted series of sculpture, about thirty-six feet from the base, running round the upper part of the wall; this was about nine feet within the external row of columns, and represented in *low* relief a Grecian procession. In the tympanum of the pediment were placed perfect statues of a colossal size, the metopes, which, from their distance from the eye, required high relief, and the frieze which was within, and was lighted only from the intercolumniations, and was only seen from the ambulatory, was in low relief, as the violent projections of high relief seen from an acute angle, would have perplexed and defeated the artist's design.

It would not be proper to close even this short account of sculpture, without referring to a branch of the art in which the Greeks excelled. Those who have been accustomed only to see the works of ancient statuary in which the ideal characters are represented, remain unacquainted with a very important and interesting class of works of ancient art, namely, the Greek coins and engraved gems. These afford specimens of the singular individuality and minute care with which the artists copied nature in their portraits, and many are nearly as admirable for their beauty and accuracy as the more important works of the statuary.

ANCIENT PAINTING.

The splendid models of antiquity have left no doubt of the perfection which the art of sculpture had attained, but the more perishable quality of pictures has prevented any such direct evidence reaching us with respect to the powers of the Greek artists in painting. We collect from the work on painting of Pliny the elder, (which was in a great measure compiled from the treatises existing in his time, and from his actual knowledge,) that the art of painting had attained an excellence equal to that of sculpture, and many eminent painters as well as sculptors are enumerated by him. Phidias, so eminent as a sculptor, was, as has been mentioned, also a painter; Apollodorus of Athens is noticed by Pliny as being the first whose painting fixed and absorbed the attention of the spectator, and as being the first who showed the method of discriminating with delicacy the various gradations of shade in painting, and hence obtained the name of the *shade painter*. Parrhasius also flourished about the same time, and contributed to the advancement of the art; his principal additions were the attention he paid to the symmetry of the human figure, giving improved expression to the countenance, and carefully finishing the extremities. The greatest painter, however, was Zeuxis; his most celebrated work was the picture of Venus at Crotona, said to have been executed from a selection of five of the fairest virgins of that city. To these must be added, Aristides, Pamphilus of Macedon, Protogenes, and Apelles, who was the painter of Alexander the Great; who being employed by his master to paint Campaspe, became enamoured whilst taking her portrait, and received her as his reward, at the hands of the magnificent monarch.

Of course the expressions of authors as to the excellences of these painters, can only be relative, and furnish no direct criterion for a comparison with the works of modern artists. Much learned controversy has been employed as to the merits and demerits of ancient painting, yet with very few grounds on either side on which to found any arguments.

Athough not possessed of any paintings of the great Greek masters, surely it may be inferred that those who had attained such excellence in the art of sculpture, who had discovered the secret of imparting such grace, such nature, such dignity to their statues, and who equally cultivated and admired painting, must also have attained a considerable eminence in that art; their excellence in sculpture may be fairly taken as a key to their standard of taste, with regard to painting.

It is, however, probable that they had not that knowledge of colours, which modern chemistry has furnished, nor was the art of painting in oil known, though Sir Joshua Reynolds (no mean authority on such a point) considers that an expression in Pliny as to the mode of painting, by Apelles, does in fact describe the effect of glazing and scumbling, such as was practised by Titian, and which implies a true taste in that wherein the excellence of colouring mainly consists. This interpretation of Sir Joshua Reynolds, on a subject purely technical, has been doubted by some critics, but the critics though learned, do not profess to be painters, or lay claim to any practical knowledge of art.

The only specimens from which we can form any decisive judgment, are the remains of pictures found in Herculaneum and Pompeii, and the frescos or paintings in the baths of Titus; with respect to the merit of the latter, it may be observed as a proof of their excellence, that it is well known, certain of them, on their discovery, were attributed to Raphael. Although these paintings do not approach to modern art, in respect of their colouring and effect, yet some of them are admitted to be of the very first merit in design: and even these specimens, though they may be received as evidence of the advanced state of the art, cannot be considered as at all exhibiting a type of what probably was the excellence in painting of the great Grecian masters; they were the production of Roman or Greek artists after the art had declined. With respect to the paintings found at Pompeii and Herculaneum, these were small and unimportant country towns, and consequently not likely to possess even what might be regarded as specimens of the best state of the art of the period at which they were executed.'

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* Ency. Metrop. "Sculpture."

The passage in which Lucian invokes the aid of Polygnotus to accomplish his perfect woman, may be cited as evidence of what was then thought to be within the compass of the art. Polygnotus "shall open and spread her eyebrows, and give her that fine, glowing, decent blush which so inimitably beautifies his Cassandra; he likewise shall give her an easy and flowing dress, with all its delicate waving, partly clinging to her body, partly fluttering in the wind."

There is every reason to suppose from the minute descriptions of Pliny, Pausanias, and Quintillian, that in the essential parts of invention, expression, grace, and character, the painters rivalled the sculptors,—but in the modern invention of grouping, and the union and separation of groups, and in the modern accompaniments of perspective for representing the distance of given objects, in beauty of landscape and back ground, together with the extreme refinement in colouring, it is probable they were deficient. On these points the descriptions afford no grounds for conclusions. The attempts at back ground in the pictures of Herculaneum are generally puerile, and the most beautiful productions of ancient painting which have come to us, are figures relieved off plain grounds, or rather blended into them.

The decline of Grecian sculpture may be dated from the age of Lysippus. From that time no improvement took place, and though many beautiful specimens were produced after this period, they added nothing to the perfection or developement of the art. On the establishment of the Roman Empire in Greece, the Greek artists sought an asylum in Rome, and there continued to practise sculpture, which was patronized by the Romans as a matter of luxury and ornament, not from the motives and with the feelings that gave rise to the excellence which the art had attained in Greece.

Chapter III.

On the Sculpture of the Romans.

The progress of the arts has in all ages nearly corresponded to that of letters; the best works of art were in the best time of Grecian literature, and the merit of the ancient Roman sculpture, imitated from the Greeks, or executed by Greek artists, was nearly in the same proportion of excellence, as the works of the Roman authors bear to the works of the Greeks, which they imitated.

After the conquest of Greece, the collection of works of art became a passion and a luxury amongst the rich, and several of the Roman emperors were patrons of artists: amongst these Augustus, Trajan, Hadrian, and the Antonines were the most distinguished. The celebrated Torso Farnese, the group of Laocoon, and that of Cupid and Psyche, which have come down to our times, are by some considered as the productions of the times of the early Roman emperors. The works executed after the time of Augustus are chiefly portraits, which, though excellent in their kind, do not partake of the grandeur and invention of the great Greek masters.

Amongst the principal compositions of Roman sculpture, are the arches raised to *Titus*, *Trajan*, *Severus*, and *Constantine*. "They breathe," remarks Flaxman, "the spirit of the people they commemorate, which was conquest and universal dominion; they owe no inspiration to the muses, urge no claim to the epic or dramatic, they are the mere paragraphs of military gazettes, vulgar in conception, ferocious in sentiment; on the columns and arches, the principal objects are mobs of Romans cased in armour, bearing down unarmed, scattered Germans, Dacians, or Sarmatians, soldiers felling timber, driving piles, building walls or bridges, carrying rubbish, shouldering battering rams, killing without mercy, or dragging or binding captives." These just observations may, with equal truth, be applied to the taste which guided Napoleon in the choice of the monuments, such as the brazen column in the Place Vendome, which he selected to commemorate his triumphs.

Statues and works of art were considered as articles of luxury, and were eagerly collected by the rich from the conquered provinces, but there are no productions, by known Roman artists, which can at all come in competition with those of Greece. As a proof of the ignorance and barbarous feelings of the Romans on the subject, Mummius, on the sacking of Corinth, said to those to whose care the specimens of art were intrusted to bring away, if they were lost, *they should be bound to replace them by new ones.* Caligula, who was a collector, displayed both his taste and knowledge, by ordering the heads of the gods and warriors to be struck off, and his own portrait stuck in their place. Works of art were, in fact, chiefly looked on as spoils to swell the triumph of the general. The rapacity of the Romans in plundering the conquered countries is particularly exemplified in the speech of Cicero against Verres, where he accuses him of not having left a single statue, gem, or any other specimen of art unplundered, and states that Syracuse under his government had lost more statues than it had soldiers in the victory of Marcellus.

Marcus Scaurus, when ædile, decorated his temporary temple with 3000 statues. Eleven thousand exquisite works of Greek and Etruscan sculpture adorned Rome in the time of her splendour; and Petronius, alluding to the taste for these ornaments and to the profusion of them, observes, that it was easier to meet a god in Rome than a man. The Townley collection, the Egyptian antiquities, the Elgin marbles, the casts of the Ægina marbles, the Phigalian marbles, together with the splendid and rare collection of Greek Coins in the British Museum, and the fine collection of casts at the Royal Academy, afford ample means for tracing the rise and progress of ancient sculpture. It is to be regretted that there has not hitherto been published some arranged catalogue of the works of ancient art which are accessible in this country, with such observations as might guide the student or the amateur in his inquiries.

CHAPTER IV.

On the Revival of the Art of Sculpture.

THE fine arts continued gradually to decline with the Roman power, until they were included in the common destruction of every thing that was great and civilized. From the fifth to beyond the tenth century, the works of ancient art became a prey to barbarism and superstition, and were buried under the ruins of those temples, forums, and palaces which they had adorned. During the long interval that succeeded the fall of the western empire, letters and the arts were equally neglected. As a proof of the completeness of the devastation, it is sufficient to observe, that on making excavations to get at the ancient buildings, the base of them has usually been found to be from ten to fifteen feet below the present surface, the whole of the overlying mass being composed of fragments of buildings, columns, statues, &c. It was at this time, that the fine architectural monuments of Rome were converted into fortresses by the contending barons. At the beginning of the fifteenth century, the city was so encumbered with ruined buildings, that two horsemen could scarcely pass abreast in any of the streets. Its state of destitution may be understood in the lamentation of Petrarch, "*That Rome was in no place less known than in Rome itself.*" So entirely were the monuments destroyed, that in the beginning of the fifteenth century, Poggio Bracciolini noticed only six statues amongst all the remains of former grandeur. Petrarch, who had done so much for the revival of literature, was also one of the first who shewed a taste for the ancient works of art, and was himself a collector of Greek and Roman medals. Rienzi also, who had formed the plan of regenerating his country, and restoring the ancient republican form of government, is supposed to have first conceived this idea, from the continued contemplation of its monuments of ancient grandeur.

Poggio Bracciolini, the discoverer of the works of Vitruvius, the friend of Lorenzo de Medici, and one of the most accomplished men of the age in which he lived, was also one amongst the earliest, on the revival of civilization, duly to appreciate the great merit of the works of antiquity, and like his patron Lorenzo de Medici formed a collection of them. He writes thus to a friend: "My chamber is surrounded with busts of marble, one of which is whole and elegant, the others are indeed mutilated, and some are even noseless, yet they are such as may please a good artist. With them and some other pieces which I possess, I intend to ornament my country seat." Again, (writing to one who was commissioned to procure statues for him:) "Different persons labour under different disorders. That which powerfully affects me, is an admiration of those productions of eminent sculptors, to which I am, perhaps, more devoted than becomes a man who may pretend to some share of learning. Nature, it is true, must always excel her copies; yet I trust I shall be allowed to admire that art which can give such expression to inert materials, that nothing but breath seems wanting." Cicero, had a similar admiration of, and desire to possess whatever specimens of Grecian sculpture could be procured: this appears from his letters to Atticus, whom he commissions to buy for him all that were to be had, for the purpose of ornamenting his study and gallery; adding, I am so passionately devoted to these objects of refinement, that while all others blame me, you only give me any assistance.[*]

After the destruction of the Roman empire in the west, such of the Italian republics as were situated on the sea-coast, were, by reason of their commerce, the first to revive in power and riches; and many of the maritime towns of Italy were fast increasing in civilization before the regenerating warmth had reached Rome. The Venetians, as early as 1085, in rivalry of Sta. Sophia at Constantinople, built St. Mark's: Mr. Flaxman states, that the mosaic pictures in the interior, are from Greek paintings of the same age. The cathedral of Pisa was finished in 1092, and soon after this, those of Verona and some others were completed. The influence, however, of barbarism and superstition had continued the work of destruction in some parts of Italy, long after the arts had begun to be cultivated in more favoured spots: schools of painting were established as early as the eleventh or twelfth centuries.[*]

It will be found, on a careful inquiry, that the elements as well as the perfection of the arts have always been received either immediately or intermediately from the Greeks by Western Europe. But this has been denied by Vasari, and, as far as concerns the Greek Christian paintings, does not seem to have been even suspected by Winkelman, who was one of the most authentic and voluminous writers on works of art. In support of this very interesting point it is stated,[†] that the first beginning of modern art is not to be so absolutely reckoned from the commencement of the eleventh century, when society began to be settled in Europe, as from the reign of Constantine, when Christianity became the established religion of the empire. Then it was that painting and sculpture ceased to be employed on the Pagan gods, and their powers were engaged to adorn the churches built by Christian emperors with representations of the persons and events of sacred history.

The Christians, during the reigns of those emperors by whom they were persecuted, were obliged to perform their sacred worship in sepulchral chambers, which were ornamented with portraits and subjects from scripture; but when Santa Sophia and the church of the apostles were built, these were embellished by statues and mosaics: in proof of which *Bosius*, in his *Roma subterranea*, exhibits Christian sarcophagi sculptured with scriptural subjects. *Monier* also, in his history of painting, gives large quotations from the fathers concerning the excellent paintings of sacred subjects in the eastern churches from the fourth to the eighth centuries. Thus showing that though the arts were degraded, yet they continued to a certain extent, (for the purposes of religious ornament,) to be cultivated throughout that period, which was devoted to the destruction of the finer specimens of ancient art. There are still remaining in the libraries of the emperor of Austria and King of France, Greek paintings, executed in the middle ages, of great beauty; but beyond all the Greek painting and sculpture now existing, those of the *Nativity* in *Santa Maria Maggiore*, at Florence, the transfiguration, resurrection, and glorification, particularly deserve notice; because they are the examples as to the particular mode of treating these subjects, which were universally followed by the Italian artists, till after the time of Raphael and Michael Angelo.

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[*] M. Fuseli considers that it appears from Cicero's works, that, notwithstanding his admiration of art, he had little real taste for painting and sculpture; but having a general taste for nature, and with his usual acumen, comparing the principles of one art with those of another, he frequently scattered useful hints, or made pertinent observations.

[*] Flaxman's Lect.

[†] Ibid.

These positions of Mr. Flaxman have been thus minutely stated, in order to remove a general and popular impression of the total extinction of art, and its sudden revival. M. D'Agincourt devoted a long period to researches in the catacombs at Rome, which had been formerly used by the early Christians, during the times of persecution, as places of worship, and which were, as before stated, ornamented with paintings and sculpture relating to religious subjects; and it is probable his splendid history of art during the middle ages, recently published, affords ample evidence to support Mr. Flaxman's opinions. We have not, however, been able to procure a copy of the original work for the purpose of consulting it.

It may be added that *Cimabue*, and *Fafi* his contemporary, both studied under Greek artists. Nicholas and John Pisani executed marble pulpits, enriched with *basso relievos* and statues, in several of the cathedrals in Italy, in the middle of the thirteenth century, in many of which (observes Mr. Flaxman) are occasionally seen an originality of idea and a force of thought seldom met with when schools of art are in the habit of copying from each other.

The next distinguished restorer of sculpture to be noticed was *Donatello*, a Florentine, " some of whose works, both in bronze and marble, might be placed beside the best productions of ancient Greece without discredit. "The bronze statue of a boy, in the gallery at Florence, is so delicately proportioned and so perfectly natural, that it is excelled only by the best works of antiquity in certain exquisite graces peculiar to the finest monuments of Greece, but which are not to be attained or expected from the endeavours of lately resurgent genius;" his marble statue of St. George also, is a simple and forcible example of the expression of sentiment and nature which the lifeless and formal figures of the earlier artists never attained; it stands upright, equally poised on both legs, its hands resting on the shield before it. Michael Angelo was so much struck by the excellence of this work, that, after admiring it for some time in silence, he suddenly exclaimed, " MARCH!"

From the time of Donatello, (passing over some inferior artists,) we come to the period at which Michael Angelo began to study, and by his perseverance and genius carried the art of sculpture to the higheat perfection which it has attained since the time of Phidias.

It may be interesting here to remark, that it is not, perhaps, generally known that England was almost the first, on the revival of the arts, to cultivate sculpture, and that we possess some of the earliest and finest specimens of the art. Sculpture, observes Mr. Flaxman, continued to be practised in this country with such zeal and success, that in the reign of Henry III. efforts were made deserving our respect and attention even at this day.

The cathedral of Wells was finished before 1242; the sculpture upon the west front of which presents the noblest and most useful and interesting subjects possible to be chosen; on the south side, above the west door, are alto relievos representing the creation in its different parts,* the deluge, and the important acts of the patriarchs. Companions to these on the north side, are alto relievos of the principal circumstances in the life of our Saviour. Above these are two rows of statues in niches, larger than nature, of kings, and queens, and nobles, patrons of the church, saints, bishops, &c. from its first foundation to the time of Henry III. Near the pediment is our Saviour coming to judgment, attended by angels and his twelve apostles. The upper arches on each side along the whole of the west front, and continued on the north and south ends, are occupied by figures rising from their graves, strongly expressing the hope, fear, astonishment, stupefaction or despair inspired by the presence of the Lord and Judge of the world in that awful moment.

In speaking of the execution of such a work, due regard must be paid to the circumstances under which it was produced, in comparison with those of our own times. There were at the period neither prints nor printed books to assist the artist: the sculptor could not be instructed in anatomy, for there were no anatomists: a knowledge of optics, and a glimmering of perspective, were reserved for the researches of the genius of Roger Bacon, who lived some years afterwards; all knowledge of geometry and mechanics was absolutely confined to two or three learned monks; and the principles of these sciences, as applied to the figure and motion of man and inferior animals, were known to none! Therefore this work is necessarily ill drawn and deficient in principle, and much of the sculpture is rude and severe. Yet in parts there is a beautiful simplicity, an irresistible sentiment, and sometimes a grace excelling more modern productions.

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* One of these, the Almighty creating Eve, Mr. Flaxman considers as not inferior to the compositions on the same subject by the great Italian masters Giotto, Buon Amico, Buffalmaco, Ghiberti, and Michael Angelo, to which it is prior in date.

It is very remarkable, that Wells cathedral was finished in 1242, two years after the birth of Cimabue, the restorer of painting in Italy; and the work was going on at the same time that Niccola Pisano, the Italian restorer of sculpture, exercised the art in his own country. It was also finished forty-six years before the cathedral of Amiens, and thirty-six years before the cathedral of Orvieto was begun; and it seems to be the first specimen of such magnificent and varied sculpture, united in a series of sacred history, that is to be found in western Europe. It is probable that the general idea of the work might be brought from the east by some of the crusaders. But there are two arguments strongly in favour of the execution being English; the family name of the bishop by whom the cathedral was built is English, (Jocelyne Troteman,) and the style both of sculpture and architecture is wholly different from the tombs of Edward the Confessor and Henry the Third, which were by Italian artists.[*]

The religious disputes and the undistinguishing persecution of the times of Henry the Eighth, caused the destruction in this country of many of our finest specimens of sculpture, and effectually checked its further progress. Had the popes of the fifteenth and sixteenth centuries been actuated by the same iconoclastic fury against the Greek and Roman superstition, as raged during that period in our country against modern works of art, we should have had to regret not only the destruction of our native specimens of art, but should have remained unacquainted with some of the greatest wonders of Grecian genius. It is to be the more lamented that this check to the cultivation of the fine arts happened at a time which offered such extraordinary assistance to their progress, as the discovery of printing, the study of mathematics, anatomy, and perspective, which had become familiar, and which contributed towards the formation of the style of the great revivers of art in Italy. It is probable that but for the check received by the fanaticism of the times, these causes would have operated in a like manner in our own country; and that the times which brought forth Bacon and Shakspeare, might have also produced fit rivals of Da Vinci, Michael Angelo, and Raphael.

We have thus very shortly traced the rise and decline of the arts of sculpture and painting amongst the ancients, and the progress of sculpture during the latter part of the middle ages, to the time of Michael Angelo.[*] In order to complete the subject, there yet remain some few observations with regard to the revival of painting, and the principles and object of that art as contrasted with sculpture: these, and some remarks on the requisites of painting, will be more conveniently considered when we come to estimate the character of the paintings of the Sistine chapel. We shall now, therefore, resume the narrative of the life.

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[*] Flaxman, Lect. I.

[*] Our limits did not admit of giving more than a few general observations respecting ancient art and the revival of sculpture. Those, however, who are inclined to further research, will find much general information in the articles "Sculpture" and "Painting," in Rees's Cyclopædia, and the Encyclopædia Metropolitana, Flaxman's and Fuseli's Lectures, and Count Cicognara's splendid work, "Storia della Scultura," 3 vols., folio, 1818, from which works our remarks have been principally collected. The work of Cicognara may be considered as forming a supplement to that of Mons. D'Agincourt on the Arts of the Middle Ages mentioned above. Winkelman's History of Ancient Art, and his other works relating to art, are learned, but for the most part dull and dogmatical, and throughout display far more erudition than either feeling or taste for the beauties of sculpture. Whatever knowledge of the latter he exhibits was obtained from Mengs, whose works on painting, and on the distinctions of the principles of the moderns from the ancients, may be read with advantage by the student. It is in a great degree to Winkelman, Mr. Fuseli considers, that Germany owes the shackles which fetter her artists, and the narrow limits of their aim; and that from him they have learnt to substitute the means for the end; and by a hopeless chase after what they call beauty, to lose what alone can make beauty interesting—expression and mind.

Chapter V.

Continuation of the Narration of the Life of Michael Angelo to the time of his being employed in building St. Peter's.

When the Medici were driven from Florence, Michael Angelo, fearing to be involved in their disgrace, by reason of his having been a retainer of the family, went to Bologna, and from thence to Venice; but not finding employment there, he returned to Bologna, where, having got into some difficulty with the police of the city, respecting a passport, he was assisted by F. Aldrovandi, one of the officers of that state, and by him employed in the execution of a statue for one of the public buildings:—for this he was paid thirty ducats. He remained with his new patron about a year, and might have stayed longer, as Aldrovandi was a lover of the arts, and delighted to employ him in reading Petrarch, Dante, and Boccaccio, on account of his Tuscan pronunciation; feeling, however, that his time was mispent, he returned to Florence.

The first work he executed on his return, was a sleeping Cupid. There existed then, as now, much prejudice in favour of the antique, and connoisseurs were often mistaken in their judgment, purchasing modern for ancient works of art. Michael Angelo was advised to send his statue, which was much admired, to Rome, to undergo the usual process of burial, and subsequent discovery and resurrection, that it might be passed off as an antique, and the price thereby enhanced. The fraud succeeded, and the sleeping Cupid was palmed off on the Cardinal St. Giorgio for 200 ducats, of which, however, the artist received but thirty; the price he originally demanded. The cardinal finding it was considered he had been duped in the purchase, sent a person expressly to Florence, to learn the truth or falsehood of the report. The messenger who went round to the studies of the different artists, under pretence of seeing their works, on visiting Michael Angelo amongst the rest, asked to see a specimen of his art; he answered that at that time he had nothing finished, but whilst conversing, took up a pen, and made a sketch of a hand. The cardinal's agent, struck with the grandeur and freedom of the style, inquired what was the last work he had completed. Michael Angelo, not thinking of the *antique* which had been sent to Rome, said it was a sleeping Cupid, and so described the statue, as to leave no doubt as to the age of the cardinal's purchase. The messenger then owned the object of his journey, and recommended him to go to Rome, as the best means at once of cultivating his art, and obtaining patronage.

In consequence of an invitation from the Cardinal St. Giorgio, he went to Rome, where he remained under his protection for about a year, but as the Cardinal had no knowledge of art, he was never employed by him in the execution of any work.

His next two pieces of sculpture were a Cupid in marble, and a Bacchus; in the execution of the latter he was considered by many as having been eminently successful. After this, he cut a group, consisting of a Virgin and dead Christ, called by the Italians a Pietá, which his biographer, Vasari, highly praises, both for the design, execution, and the great knowledge of anatomy displayed in it. This was placed in a chapel in St. Peter's, and the artist hearing a party of Lombards, who were examining the works of art in the church, attribute it to one of their own countrymen, in order that he might not again be robbed of his fair credit, shut himself up at night in the chapel, and cut his name on a part of the drapery of the group.

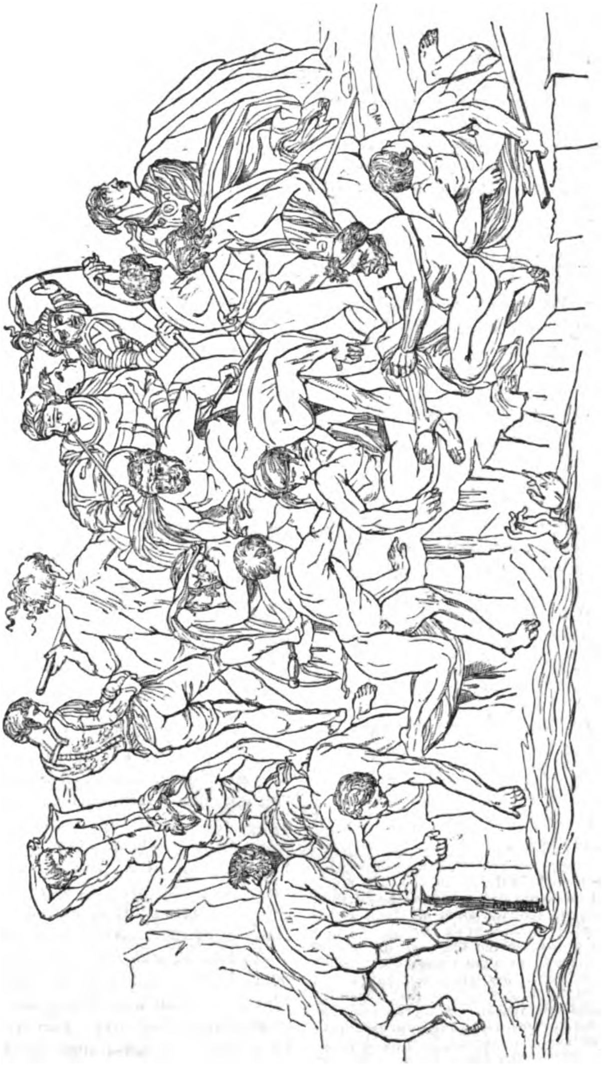
After Peter Sodarini had been appointed to the head of the government, and the broils of party had begun to subside, Michael Angelo was induced again to return to Florence. It was during this period that he obtained permission to use a spoiled block of marble, out of which some other sculptor had begun to cut a statue, but which remained unfinished: from this, he cut his celebrated statue of David with a sling in his hand; the difficulty of the execution of which was much increased by the block not being entire. Vasari relates an anecdote with respect to this statue, which has often been repeated as an illustration of the style of criticism of ignorant pretenders; Sodarini, on going to view it, considering himself called on to make a remark, found some fault with the shape of the nose; Michael Angelo, however, rather than waste time in convincing him of his error, mounted the scaffolding, and pretended to chisel off the offending part, without in fact touching it, contriving dexterously to drop from his hand some marble dust; as he proceeded, the fastidious critic declared himself satisfied with the improvement, and with this last touch the statue was pronounced complete.—For this work he received 400 ducats. He also executed a bronze statue of David for Sodarini, and was employed in some other works, particularly in the execution of a picture for one Agosto Doni, who was a collector of specimens of the fine arts; this work is stated to be the only authentic specimen now remaining of an easel picture by him. On sending it home, his servant, by his master's direction, demanded seventy ducats. Doni, thinking to get it for less, sent back forty; Michael Angelo returned the forty ducats, and insisted on having 100 ducats or his picture. Doni, to compromise matters, sent the seventy which were first required, but the painter replied that he would now have twice seventy ducats or his picture; Doni, knowing the value of the work, and the pertinacity of the painter, rather than lose it, sent the 140 ducats.

In some subsequent pages, we shall devote a short space to the consideration of the revival of painting, tracing the art up to the age of Michael Angelo. At the head of those who most conduced to the perfection of it will be found Leonardo da Vinci, whose various attainments placed him amongst the most remarkable persons of his time. Hitherto Michael Angelo had chiefly devoted himself to sculpture; and at the period when he was at Florence, Da Vinci, who was considerably older, had already attained the first rank as a painter.—Some jealousy had long subsisted between the two rival artists, and an opportunity was now afforded to them of making an effort which should decide to whom the palm of superiority was to be awarded.

Sodarini (whose admiration for the genius of Michael Angelo increased daily) determined to employ him to paint one side of the council hall of the government palace, and Leonardo da Vinci was, at the same time, directed to execute a picture for the opposite part. Da Vinci chose for his subject the victory gained by Anghiari over the celebrated Piccinino, the general of the Duke of Milan; the principal objects in the foreground were a mêlée of cavalry and the taking of a standard. This work, though it displays great excellence, and has been designated by an eminent critic as exhibiting "such talent as rarely occurs in the world," was by common assent admitted to be surpassed by the production of his rival. Buonaroti's subject was the battle of Pisa; in the historical account of the battle it was stated that the day on which it was fought was particularly hot, and that a part of the infantry was bathing quietly in the Arno, when on a sudden the call to arms was heard, the enemy being discovered in full march to attack the troops of the republic: the first impulse produced by this surprise, was the moment of time selected by Michael Angelo. Neither artist, however, executed the paintings, only the cartoons, or original drawings on paper representing the composition, having been prepared.

Benvenuto Cellini (who cannot be accused of being a panegyrist of Michael Angelo) says of this work, "The different attitudes of the soldiers suddenly preparing for battle, are so admirably expressed, that no work, either of the ancients or moderns, has attained such excellence: as I have said, the cartoon of Leonardo da Vinci was also very excellent; the one was placed in the hall of the pope, the other in the palace of the Medici, and whilst they remained, they formed the study of the whole world. Although Michael Angelo has since executed the pictures in the Sistine chapel, he did not exhibit half the talent which was shewn in his cartoon of the battle, nor did he afterwards produce any thing equal to this effort of his early genius."

Vasari particularly notices the expression of an old soldier, who, to shade himself from the sun's rays, had placed a chaplet of ivy on his head; he is sitting on the ground dressing himself, and the peculiar excitement and haste occasioned by the difficulty of passing his garments over his wet limbs, shewn by the strong marking of the muscles and an expression of impatience about the mouth, is described as unequalled. It was considered at the time the most excellent design that had ever been executed. All the celebrated painters of the day attended to make studies from it. The cartoon itself was, however, a few years after its completion, destroyed. Its destruction is attributed to the envy of Baccio Bandinelli, a friend and partisan of Da Vinci's, who is supposed to have got admission to the room where it was kept, and to have carried it away piecemeal. After Sodarini was driven from the government, it was removed to an upper apartment in the Medici palace, where artists were freely admitted. Although nothing remains of the work itself, a small copy of most of the figures was executed at the time, and is now at Holkham, the seat of T. W. Coke, Esq. This has been engraved in the gallery published by Mr. Foster, and a small outline sketch is here added to give an idea of that which in its original execution was considered the most masterly design ever executed.



On Julius the Second succeeding to the papal crown, he called around him the most learned men, together with the most eminent artists of the age. Michael Angelo was amongst the first who were invited to Rome, the pope having determined to employ him in the execution of a magnificent sepulchral monument, which he contemplated erecting in his life-time. From the original design, it appears that this was to have been a parallelogram of thirty-four by twenty-three feet, ornamented with forty figures, some of which were colossal; in addition to the figures, there were to have been a vast number of bronze aud marble columns, basso relievos, and other architectural ornaments. If this work had been completed in conformity with the plan, it would have been the most splendid monument of the kind ever produced; a sketch of the original design has been published in Bottari's edition of Vasari.[*]

Although the execution of the figures would have given full scope to Michael Angelo's powers, yet as the chief part of the design was to have consisted of representations of Poetry, Painting, Architecture, and the provinces conquered by the pope, in attitudes expressive of their grief for his loss; it must have been deficient in sentiment, and like all allegories have failed in creating any real interest, beyond that excited by the excellence of the mechanical execution.

It became difficult to find a site suited for the reception of this intended work. San Gallo, the architect, suggested, that so considerable a monument was worthy of having a chapel built on purpose to receive it. Julius considering that it could not be well placed in the old basilica of St. Peter's, it was at last determined that the church itself should be rebuilt, and hence the origin of the present church of St. Peter's, the most stupendous structure that the art of man ever produced.

"By those," observes Mr. Duppa, "who are curious in tracing the remote causes of great events, Michael Angelo may, perhaps, be found, though unexpectedly, thus to have laid the first stone of the reformation. His monument demanded a building of corresponding magnificence: to prosecute the undertaking, money was wanted; and indulgencies were sold to supply the deficiency of the treasury; a monk of Saxony opposed the authority of the church, and it is singular that the means which were employed to raise the most splendid edifice to the Catholic faith which the world had ever seen, should, at the same time, have shaken that religion to its foundation."

In order to procure blocks of marble fitting for the execution of the monument, Michael Angelo, who spent eight months at Carrara, sent a portion of what was requisite to Rome and the remainder to Florence, intending, during the unwholesome season at Rome, to execute some of the figures in that city. The marble was placed in the court in front of St. Peter's, and the pope, in order that he might be enabled to watch the progress of the work, had a covered way constructed from the Vatican to the study of Michael Angelo, who enjoyed his friendship and esteem, and whom he used frequently to visit.

Whilst at Carrara, he conceived the idea of executing a colossal statue, out of an insulated rock on the coast, at a point where it would have been seen by the vessels passing either from Genoa or Leghorn: it is said the same idea had occurred to the ancients, and some works in the rock are still shewn as having been the commencement of a similar design. The only colossal statue now existing, is the bronze one of St. Charles Borromeo, near Arona, looking over the Lake of Como, and those only who have seen this work, (the head of which is large enough to hold several persons,) can form any just idea of the probable effect which such a statue, by Michael Angelo, would have produced.

As the figures for the monument proceeded, they obtained universal admiration; but excellence and eminence are accompanied by envy. The favour shewn to Michael Angelo had early produced him enemies, and his disposition, which was independent, unsuspecting, and somewhat haughty, was not such as to guard him against their evil machinations.

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[*] Henry the Eighth, in the beginning of his reign, also conceived the same idea as Julius the Second; and ordered Torrigiano, the rival of Michael Angelo in the garden of Lorenzo de Medici, and who was employed to execute the tomb in the chapel of Henry the Seventh, to make a magnificent monument for himself and his queen.—Although this was not intended to be so large as that originally designed by Michael Angelo, yet in richness and number of figures, it would (if it had been executed) have much excelled it. It appears from the description in Speed, which was taken from a drawing approved by the king, that the height was to have been 27 feet, breadth 20 feet, the depth 15 feet, and here were to have been 133 statues, 43 basso relievos ilt bronze, and 20 columns in the architecture, of yry, oriental alabaster, and serpentine marble.

By the pope's directions he always applied to him for the money requisite for the work; on the arrival of some marble from Carrara, payment for the freight being required, he went to the Vatican.—He found the pope engaged in state matters, and therefore returned home and paid for it with his own monies, thinking to be reimbursed immediately: on returning however to the pope, he was repulsed by a groom of the chamber, and refused admittance to his patron, apparently, nevertheless, not by the direction of Julius. He went home in anger, and, ordering his servants to sell off all his effects, fled immediately to Florence. When Julius heard of his departure, he dispatched five couriers, one after another, to induce him to return; but Michael Angelo, who had reached the Florentine states, and was thus out of the pope's power, refused to listen to them, though he was at last induced to return an answer, in which he stated, that having been repulsed with ignominy, he had determined to retire from his service, and seek employment elsewhere. Julius, being unsuccessful in prevailing on him to return, actually dispatched a brief to the Florentine republic, requesting that he might be sent back. These proceedings of the pope are a convincing proof of the estimation in which his services were held:—the document is so curious that we shall give it at length.

"Health, and apostolic benediction to our dearly beloved Michael Angelo, who has left us capriciously, and without any reason that we have been able to learn, is now in Florence, and remains there in fear of our displeasure, but against whom we have nothing to allege, as we know the humour of men of his character. However, that he may lay aside all suspicion, we invite him with the same affection that you bear towards us; and if he will return we promise on our part that he shall be neither touched nor offended, and be reinstated in the same apostolic grace he enjoyed before he left us."

This brief was also disregarded by Michael Angelo, who hoped that the pope, not having an answer, might cease to think of the matter. On his return to Florence he proceeded to complete his cartoon of the battle of Pisa, which had been left unfinished; but in addition to the first letter, two others followed, and these were couched in a more authoritative tone than the former. Dreading the anger of Julius, should he be compelled to return to Rome, he determined, in consequence of an invitation from Bajazet the Second, to proceed to Constantinople, to superintend the erection of a bridge between that city and Pera.

Sodarini, however, at length, prevailed on him to listen to the pope's wishes, probably not feeling any inclination to involve the state in a dispute with the Holy See. To ensure him from any violence, he was invested with the title of ambassador from the state, and recommended to a cardinal, the brother of Sodarini, who undertook to introduce him to the pope, who had just then entered Bologna as a conqueror at the head of his army. Julius, angry and impatient at the opposition to his wishes, on receiving Michael Angelo, said, "What! instead of coming to me, you have waited till I came to you," alluding to his being then at Bologna, which is near to Florence. He deprecated the pope's anger, and requested pardon for a fault which he had been excited to commit, under the impression that he had been repulsed with unmerited indignity. A bishop who, from the illness of Cardinal Sodarini, had been deputed by him to introduce the penitent to the pope, conceived this was a good opportunity to entreat the forgiveness of his holiness, urging that the culprit was ignorant of life, and of all but his art: this turned the tide in Michael Angelo's favour, and the unfortunate bishop was reproached by the pope for having dared to insult one whom he, the pope, even in his anger had never degraded; thus the audience ended with the hasty expulsion of the bishop and the reception of the artist into favour, who received the holy benediction, accompanied by a solid earnest of future protection.

Whilst at Bologna he was commanded to execute a bronze statue of the pope. When Julius went to inspect the model of this work, observing that he was represented with an air of severity, with one arm raised as giving the benediction, he asked the artist if he meant to make him giving a benediction or a malediction to the people. Michael Angelo dexterously answered that it was only intended to threaten them in case they did not shew obedience. On being asked whether he would have a book in his left hand, Julius (who had entered the city at the head of his army, and who had distinguished himself in many military encounters) replied, No; a sword suits me better than a book, as I know more about the one than the other.

The pope returned to Rome, and Michael Angelo remained sixteen months to finish this bronze; but the people, unmindful of the pope's malediction, destroyed the statue as soon as his partisans ceased to have power in Bologna; and the pieces (except the head, which was long preserved in the museum of Duke Alphonso at Ferrara) were cast into a piece of ordnance, and christened Julia after the pope.

When this statue had been completed, Michael Angelo returned to Rome: here he was again thwarted by the jealousy of one of his rivals, Bramante, then the architect of St. Peter's, who, conceiving that the pope inclined more to sculpture than architecture, persuaded him to abandon for a while the completion of the monument, urging that it was ill-omened to prepare a tomb during his life. It was he who suggested to the pope that Michael Angelo should be employed in the painting the vault of the Sistine chapel, erected to the memory of his uncle Sixtus. Bramante's object in doing this was a hope that by these means Michael Angelo would be prevented from displaying his genius in that art in which he most excelled, and would, in the exercise of one in which he was almost unskilled, be brought in comparison with his relation Raphael, then just rising into eminence and favour at the papal court. Michael Angelo, at once desirous of completing the monument, and of avoiding the execution of a work in colours, an art which he had not practised, did all he could to persuade the pope to consign the ornamenting the chapel to Raphael.

Julius, whose temper was too eager and ardent to enable him to wait with any thing like patience the time requisite for the completion of the monument, which required much study and thought, was not sorry for an excuse to change the employment of Michael Angelo; and it is probable his independence and unbending manner were displeasing to a pontiff, little accustomed to opposition; this, and the frequent demands for money as the work proceeded, may have made him glad to find some reason for suspending the completion of the tomb.

When Michael Angelo found that he could not change the pope's determination, he set to work on his design in good earnest. Finding the scaffolding erected by Bramante unsuited to his object, he invented one of a superior construction and of great simplicity, which was adopted in the building of St. Peter's; and, as suggested by Mr. Duppa, is most probably the same admirable piece of machinery which is now used at Rome whenever there is occasion for scaffolding to repair or construct the interior of public buildings. He gave this invention to the poor carpenter who was employed to construct it, and who, by the profits derived from it, was enabled to raise a marriage portion for his two daughters. Unused to working in fresco, which is done by painting on the wet plaster so that the colour becomes incorporated in the wall, and requires much experience and practical dexterity, Michael Angelo met with many difficulties in the progress of his work, and at first sent for two artists from Florence to instruct and assist him, but these were soon dismissed, and the whole work executed by himself. Julius, who was old, and eager for the completion of whatever he had once planned, used frequently to visit the painting during its progress, and became so impatient to see the effect of the design, that, in order to gratify his curiosity, the scaffolding was by his order removed before the picture was finished; and so desirous were all to see the ceiling about which such expectation had been raised, that the area of the chapel was immediately filled, the pope entering even before the dust occasioned by the removal of the boards had cleared away. Vasari says, that Raphael on seeing this great work, changed his style, from the hints it afforded: this, however, is questioned by the partisans of that great painter. It is not, however, of much importance to consider how far it was correct: no one will be so hardy as to deny that in the art of design, the greatness of Michael Angelo's genius might have furnished hints for improvement even to so distinguished a master as Raphael.

Bramante, if he had really conceived that he should lower the reputation of Michael Angelo, by compelling him to work at a branch of the art with which he had previously but slight acquaintance, must have been completely disappointed in his object. It is stated, however, that he tried to prevent Michael Angelo from completing the whole, and to persuade the pope to allow Raphael to execute the designs for that part of the chapel which was unfinished. Julius however, more firmly than ever convinced of the powers of Michael Angelo, by this new proof which he had afforded, confided the whole work to him, and continued impatient for its completion. It is, however, probable that he did not, in the irritable temper and independent bearing of the painter, find so accommodating a spirit as he was accustomed to discover amongst his courtiers and dependents. The patron and artist were often at variance during the progress of the work, and for some impatient answer which he received from Michael Angelo, the pope threatened to have him thrown down from the platform on which he was painting, if the work was not speedily finished. At the end of twenty months the scaffolding was removed for the last time, and at length in possession of his wish, the pope on All Saints Day sang mass in the chapel. Michael Angelo thus hurried, had not put the finishing touches to some of the parts; but though he was permitted to do this, he left his work as it was, rather than have the scaffolding erected anew. When the pope suggested that there was a want of ornament and gilding which he wished to have added; Michael Angelo, feeling perhaps that this would impair rather than add to its grandeur, said, " No, holy father, those who are represented in these designs were simple men, and wore neither gold nor silver, they were poor but holy, despising all worldly riches."—For this great work he received 3000 crowns.

A brief notice like the present does not afford an opportunity of entering into any detailed description of these pictures; neither would any great advantage result from doing so. In a subsequent page, however, in considering the character of the different paintings of Michael Angelo, we shall give the opinion of Sir Joshua Reynolds and Mr. Fuseli on these works; authors, perhaps, more capable of appreciating their merit, than any who have yet written on the fine arts.

The size of our page does not enable us to give an idea of the various designs of which this great work consisted, but an outline is given of a single group in one of the compartments, representing *Charity*, which Mr. Flaxman pronounces to be the finest group, ancient or modern, ever designed.

Julius, whilst he patronised and richly rewarded his favourite, appears to have been a hard task-master, and to have treated him on more occasions than those already enumerated with harshness and caprice. This, the independent and irritable spirit of the artist could not brook, and the result was that he was more than once in disgrace. Just before his death, the pope ordered Cardinal Santi Quattro and his nephew the Cardinal Agnese to cause his mausoleum to be completed, though on a smaller scale than that which was originally planned; but Michael Angelo was again thwarted in his desire to finish this work which had been so long begun, and which would have been a splendid tribute to the memory of one who had been his patron. Leo the Tenth, who succeeded Julius, immediately after his accession employed him to go to Florence to execute a magnificent façade to the church of St. Lorenzo, which had remained unfinished from the time of his grandfather Cosmo de Medici. The cardinals intrusted with the superintendence of the monument, and the artist himself, for some time resisted the order; but the wishes of Leo were soon discovered to be commands, and Michael Angelo once more departed, even in tears, (as his friend Vasari states,) to Carrara, to superintend the procuring the marble for this new work. The only indulgence which could be procured was that he might, whilst at Florence, proceed in the execution of the figures for the mausoleum. When he had arrived at Carrara, Leo hearing that there were quarries within the Florentine dominions, where it was conceived marble equally good as that at Carrara might be procured, Michael Angelo was ordered to proceed to them in order to superintend the obtaining the marble, notwithstanding he represented that the quality was inferior, and that from the situation of the quarries it would be necessary that roads should be cut through both mountains and marshes for its transport. If the reader has felt regret that one so devoted to his art—one who had given such testimony of genius, should have met with so much opposition and found such little real encouragement, his feelings of disappointment will be increased when he learns that the great talents of Michael Angelo were during the whole reign of Leo, employed in the execution of that which probably would have been as well or even better performed by a

stone-mason. Eight years and some months, (being the whole pontificate,) were entirely spent at these quarries, and in petty disputes with the agents of the pope as to money.

Historians, and particularly Mr. Roscoe, have given Leo more credit for his patronage of genius than, perhaps, he merited. With respect to Michael Angelo, it must be admitted that he reaped no benefit from the magnificence of him whōm it has been the fashion to represent as the universal patron of genius. His title to this praise has been successfully impeached by Mr. Duppa, who observes, that when he ed the papal throne, the arts in Rome were in their meridian, that he found greater talents than he employed, and greater works commenced, than he completed; that those men who have been for succeeding ages the admiration of mankind, Leonardo da Vinci, Michael Angelo, and Raphael, executed their best works before his accession; and that Bramante, the architect of St. Peter's, died in the second year of his pontificate. Leonardo da Vinci is acknowledged not to have been benefited by his munificence; and, for the magnificence of the state chambers in the Vatican, posterity is indebted to Julius the Second, as those two rooms, which were painted by Raphael, which are his greatest productions, were nearly completed at the pope's death.

It may indeed be questioned whether Leo the Tenth had any very refined taste for works of art, when it is considered that the cartoons which Raphael was employed by him to execute, were sent to Flanders, as patterns for tapestry; and that when the carpets were executed, no inquiry appears to have been made after the original designs, seven of which now form the most valuable specimens of art in this country; from the merit of these, the value of those which have been destroyed, may well be estimated: again, as to Leonardo da Vinci,—one qualified to stand in rivalry with Michael Angelo,—the painter of the Last Supper, it is even doubtful whether he visited Rome during the time of Leo, but it is certain he was at no time employed by him.

On the death of Leo, during the reign of his successor, Adrian the Sixth, the arts were no longer favoured at Rome: and Michael Angelo was allowed to employ himself in the execution of two statues, which were to form part of the monument of his patron Julius.

The Duke of Urbino, the nephew of Julius, impatient at the delay which had taken place in the execution of this work, sought to compel Michael Angelo to account for some large sums of money, which it was pretended had been received by him. The duke petitioned Adrian that he might be summoned to Rome for the purpose of rendering the required information. Giuliano de Medici, (afterwards Clement the Seventh,) who was at this time governor of Florence, had employed Michael Angelo to erect a library and new sacristy to the church of St. Lorenzo, to serve as a mausoleum for the Medici family: in order that he might be allowed to proceed with these, the governor interfered with the pope, and obtained permission that the artist should remain at Florence. He was in no danger of receiving from Adrian any new commission which would interrupt the progress of his works, as the pope was not only ignorant of, but hostile to the fine arts; and had even determined to destroy the paintings of the Sistine chapel, conceiving that they were more fitted for a bath than a church; and when the group of the Laocoon was shewn to him, he is said to have turned away, refusing to even look at the idols of the heathens. This pope, who was considered by the Italians as a Flemish barbarian, died after a short reign of twenty months, to the great joy of the Romans.

Adrian was succeeded by Clement the Seventh, whose desire that Michael Angelo should proceed with the works at Florence which he had ordered, again interfered to prevent the completion of the monument. The complaints of the nephew, however, at length compelled the artist to return to Rome, in order to attempt some amicable arrangement with respect to these claims. The weakness, ambition, and crooked policy of Clement early involved him in ruin, and soon after his accession he was taken prisoner, and his capital plundered by the army of the Constable of Bourbon. Up to this period Michael Angelo had only to contend with the perversity and injustice of his patrons, and the jealousy and opposition of his rivals; in addition to these, he now found himself involved in the troubles of contending parties; and without coming to any settlement with the duke, he determined again to leave Rome for Florence, that he might proceed with the chapel and library of St. Lorenzo.

From the time when Sodarini had been driven from the government, Florence became again subject to the rule of the Medici. When the ecclesiastical states were overrun by a foreign enemy, the Florentines began to entertain hopes of ridding themselves of their oppressors, and of obtaining a free government. For this purpose they were induced to join the Venetians, together with the Dukes of Ferrara, Mantua, and Urbino, who had united with England and France in order to oppose the growing power of Charles the Fifth. One of the first objects of Clement on the recovery of his liberty, was to reconquer the Tuscan states, the sovereignty of which was guaranteed to his family by the treaty of Barcelona. The Florentines, although unsupported by their allies, and abandoned to their fate by Francis the First, who was compelled to enter into the treaty of Cambray, maintained a gallant struggle for their liberty. When it was determined to fortify the city, Michael Angelo was appointed the military architect, or engineer to superintend the erection of the necessary works; and he, preferring the liberties of his country to the interests of the family of his patron, did not hesitate to accept the task.

His appointment to such an important

post is a proof of the high estimation in which his talents were held by his countrymen. Before commencing the necessary works, he went to Ferrara to inspect the fortifications, which were then considered to be the best in Italy. Whilst there, he was received by Alphonso Duke of Ferrara with great courtesy, who afforded him all the information and assistance which he required. The duke took the opportunity of his presence to request that he would execute some work of art for him, and on his return to Florence, notwithstanding his urgent occupations respecting the defence of the city, he commenced a picture of Leda, which Vasari describes as exquisitely beautiful. This painting it appears, however, never reached the duke, because, as is related by Michael Angelo's biographers, some one sent by the duke expressed dissatisfaction at the work, which induced the indignant artist to refuse to send it, and it was given, together with some models, to one of his attendants, who took them into France. The Leda afterwards came into the possession of Francis the First, but was nearly obliterated by the holy fury of a confessor in the time of Louis the Thirteenth. A French artist, who saw the picture at Fontainbleau after it had been injured, says the remains of it possessed much of the manner of Titian in the colouring, and in support of this it is to be remarked, it was not till after Michael Angelo's return from Venice, where he became acquainted with that great master's style, that he finished the Leda. The original cartoon or design for this work, was some years since brought to this country by Mr. Lock, and by him presented to the Royal Academy. During this period, in addition to painting the Leda, he proceeded with the figures for the monument in St. Lorenzo.

Michael Angelo appears to have displayed equal skill and patriotism in his conduct throughout the siege, and in all respects to have justified the confidence reposed in him by his country. The Florentines struggled bravely for the maintenance of their independence, and, aided by his skill, long defended themselves against the besieging army of the Prince of Orange, the general of Charles the Fifth. Having reason to doubt the good faith of some of the leading persons intrusted with the command of the defence, Buonaroti informed the authorities of his suspicions, but the information was disregarded, and his warnings were attributed to timidity. Finding himself treated with contumely and contempt, and despairing of rendering assistance to those who were unwilling to serve themselves, he determined to withdraw secretly from Florence and go to Venice. He left the city in company with one of his scholars and a friend, and they carried with them 12,000 crowns in gold concealed in their cloaks. In passing through Ferrara he was recognised by the duke, who happened to see his name in the list of strangers which was kept by the police, and sending for him shewed him all respect, and by every kind of persuasion, joined to the offer of an honourable provision, endeavoured to induce him to remain at Ferrara, at least until the war was ended. He persisted however in his determination to depart, but not wishing to be outdone in generosity even by the duke, pointing to the cloaks of his companions where the gold was concealed, said that he had with him 12,000 crowns, which, if wanted, were at the duke's service. From Ferrara he proceeded to Venice, living as much retired as the importunities of those, who were desirous of doing honour to his genius, would permit. While there he is said by Vasari to have made, at the request of the doge, the design for the famous bridge of the Rialto, though it is now generally understood that the drawing from which the bridge was executed, was not the one made by him.

The Florentines soon finding their loss, followed him by entreaties to return to their assistance; and as concessions were made, and reparation offered for the indignities and slights received, he, at some personal risk, returned to his country, in order once again to renew the struggle for the maintenance of its liberty. The emperor, having effected a treaty with the Venetians, and all Italy except Florence having been restored to peace, was enabled to concentrate his forces: this, coupled with the treachery of the captain-general of Florence, hastened the downfal of the city, and a capitulation was entered into, in which there was provision for the preservation of life and liberty to those who had dared to defend their country against conquest and oppression. This treaty was explained as all such treaties are usually interpreted, where the strongest retains the power of dictating the terms of its construction. The pope having attained the object of his ambition, soon found means, without breaking the letter of the treaty, to wreak his vengeance on those whom he hated, and who had opposed him. The offenders were not punished for opposing the power of the pope, the treaty protecting them in that respect; but they were found guilty on the pretext of having been *enemies to the republic!* Aware of his danger, Michael Angelo is said to have concealed himself for many days in the bell-tower of St. Nicholas to avoid the fury and the treachery of Clement. Some persons, however, state as a reason for the pope's especial anger against him, that he had proposed, during the defence of Florence, the razing the palace of the Medici. He was not mistaken in his view of the pope's clemency, for strict search was made for several days by order of Clement, who finding this unsuccessful, at last published a notice that he would let him remain uninjured, on condition he should proceed with the monument to the Medici. He was induced to confide in this assurance, trusting less to the good faith of the pope, than to his knowledge that it was Clement's eager desire the monuments and library should be completed.

There can be no doubt, from the accounts of both of his biographers, that Michael Angelo was constantly desirous of finishing the great monument to Julius which had been so long delayed; the orders and importunities of Leo the Tenth and of Clement, we have seen, had long prevented him from doing this, however he might wish it. The Duke of Urbino continued to urge him, and loaded him with unjust reproaches for having misapplied large sums of money received on account: this, on inquiry, turned out to be untrue, and the discovery had the effect of cooling the ardour of the duke, who found he should be obliged to contribute more funds. After much wrangling and negotiation, it was determined that the monument should be completed for the sum which had been actually received; and instead of an insulated work ornamented on all sides, on the scale originally proposed, the plan was altered and only the front façade was to be executed. The desire of Clement that he should proceed with the works at Florence, tended to facilitate this arrangement for the diminishing the work, as the pope's wishes, like those of Leo the Tenth, were considered by all as laws. After much vexation and unjust treatment, it was stipulated that he should work four months at Florence and the remainder of the year at Rome.

On returning to Rome for this purpose, he received fresh orders from Clement, who commissioned him to make designs for painting the two ends of the Sistine chapel, the ceiling of which he had before painted under the patronage of Julius. Although he could not refuse the command, he delayed as much as possible making the cartoon of the Last Judgment, which was the subject chosen, whilst he proceeded by stealth with the statues for the monument. The death, however, in 1534, of Clement, released him from these commands. He then conceived the time was at last arrived when he should be at liberty to go on with the long delayed work; but even now he was disappointed. Paul the Third, the new pope, was no sooner elected, than he sent for him, expressing his desire that he should devote all his time to his service: this he declined, pleading his contract with regard to the unfinished monument. But Paul, who was old, and not willing to brook opposition, was not less determined to be obeyed than any of his predecessors. "What!" said he, "cannot I, now I am pope, command that which I have been wishing to attain for these thirty years! Where is this contract you talk so much about? I will tear it to pieces."

It appears, in order to rid himself of the importunity of the pope, Michael Angelo had determined to withdraw himself to Urbino, that he might in quiet complete the monument. Paul, however, was too eager for his services to let him thus escape; and early paid a visit of state, accompanied by ten cardinals, for the purpose of seeing all the statues which had been executed for the monument, and the sketches and cartoon for the Last Judgment. One of the cardinals seeing the statue of Moses, intended for Julius's tomb, in order to pay court to the pontiff, exclaimed, "This alone is enough to do honour to Pope Julius!" Paul again renewed his solicitations, and the Cardinal of Mantua, seeing that the cause of the artist's reluctance was the unfinished contract, undertook an arrangement with the Duke of Urbino, whereby only three statues were to be completed by Michael Angelo, and the rest were to be executed under his direction by others, he, however, paying the cost. Thus the plan and contract were changed for the fourth and last time, and Paul was enabled to gratify his eagerness to become the patron of the great artist. The monument to Julius, after all the various changes and the different impediments which have been noticed, was at last finished, and put up in St. Pietro in Vinculis. Of the seven statues of which it is composed, only three are the work of Michael Angelo, viz. the celebrated Moses,* and the two figures on the side personifying Virtue and Religion; the remaining four were the work of others. The other statues which were executed or begun for this monument were not used. The two which were completed are, or were, in the public collection at Paris; and the other four, which were only commenced, support the roof of a grotto in the Boboli gardens at Florence.

Paul, on the commencement of the painting of the Last Judgment, remunerated Michael Angelo by a considerable pension for life. The grant commences by stating that, "Wishing to remmuerate you for the fresco painting representing the last judgment, in consideration of your labour and ability, which is an honour to our age; we promise," &c. This grand work was finished in 1541, and was opened at Christmas to the admiration of the world. In a future page, when considering the works executed by Michael Angelo, we shall lay before the reader the remarks both of Sir Joshua Reynolds and M. Fuseli on this picture, perhaps the most remarkable that was ever executed by any painter.

After the completion of the Last Judgment, the pope directed the painting in fresco of the walls of a chapel which had been built by San Gallo, and which was called the Pauline chapel. The subjects chosen were the Conversion of St. Paul, and the Crucifixion of St. Peter. The smoke of the tapers during the frequent celebration of high mass in this chapel, has so totally obscured these pictures that the subjects are now scarcely to be distinguished. These were the last works in fresco by Michael Angelo, then of the age of seventy-five years, who feeling his powers much diminished, complained to his friend Vasari that fresco painting was not a fit work for old men. Fuseli considers these as the dotage of his style, yet as possessing parts which make that dotage more enviable than the vigour of mediocrity.

San Gallo was the architect generally employed by the pope, but Michael Angelo's experience during the siege of Florence, was the cause of his being consulted respecting some fortifications of the castle of St. Angelo, then in progress. From the consciousness of his talents, he appears to have given his opinion freely on the proposed plans; and this so completely proved them to be erroneous that the works were never completed. This freedom however led to many disputes and jealousies between the rival artists. Though his age prevented his continuing to paint in fresco, Vasari states, that he continued to work in marble, saying that he found the exercise of the mallet and chisel necessary to keep him in health. After his last painting he commenced a large group, the principal figure of which was a dead Christ: this, though never entirely finished, was taken to Florence and placed behind the great altar in the metropolitan church, where an inscription records that it was the last work in marble which he executed.

We are now arrived at that period of the life of Michael Angelo which is marked by his great work in architecture: he had already executed both in sculpture and painting the most extraordinary productions ever completed by any one man in any age; and at the age of seventy-five years was about, in a manner, to commence a new career.

What has hitherto been written has related to the painting and sculpture of Michael Angelo, we shall next have to consider him as an architect, particularly as regards his share in the construction of St. Peter's. Before, however, entering on this, we shall make some general observations on his works in sculpture and painting, prefacing these with a few remarks on the revival of painting in Italy.

It is not perhaps generally known that we possess in this country an unfinished bas relief by Michael Angelo, cut in marble; which was purchased in Italy by the late Sir George Beaumont, and by him bequeathed to the Royal Academy. It is of a circular form, consisting of three figures, representing the Virgin, the Infant Saviour, and St. John; it is composed with much grace. A small outline of this is added from a drawing made by the leave of the President of the Royal Academy. We may here be permitted to regret, that some arrangement could not be made by which this, the cartoon of the Leda before noticed, and other valuable works possessed by the Academy, might be rendered generally accessible to the public. M. Ottley possesses a picture in distemper and a bust, both of which, according to his opinion and that of M. Fuseli, were executed by Michael Angelo.

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* A sketch of this figure is given in the frontispiece to this memoir.

Chapter VI.

On the revival of Painting in Italy.

The notices contained in the works of several of the most distinguished of the Italian historians, prove that there were painters in Italy during the dark ages, and Rome still possesses several specimens of art which prove this. Lanzi, in his history of painting in Italy,[*] adduces in proof of this statement, amongst others, the two vast works unrivalled by any others in Italy. The first is the series of popes, which, in order to prove the succession of the papal chair down to the time of St. Leo, this pontiff caused to be painted; a work of the fifth century, and which was subsequently continued until our own time.

The second is the decoration of the whole church of San Urbano, where there are several evangelical acts represented on the walls, along with some histories of the tutelar saint and St. Cecilia, a production which Lanzi considers as not partaking either of the Greek lineaments or style of drapery, and which, he says, may justly be attributed to an Italian pencil: this has subscribed upon it the date of 1011. The evidences afforded by the catacombs at Rome of the continued existence of art during the early ages has been already noticed.

The painters, however, of those times produced little else than mere mechanical efforts, chiefly following the examples afforded by the Greeks, and it was not till the improvement in sculpture, in the middle of the thirteenth century, that any sensible progress in painting is really discoverable.

Though the principal share in the honour of the revival of the arts is due to Tuscany, the Pisans led the way; as they were the first to throw off the trammels imposed by the Greek artists, and first began the study of the ancient monuments of Greek and Roman sculpture, and from these drew the true principles of art.

The improvement in sculpture was followed by that of the art of executing designs in Mosaic by Fra Jacopo, or Fra Mino da Turrita, also a Tuscan.

Lanzi says it is not known whether he was instructed in his art by the Romans or by the Greek workers of Mosaic; but that it is well ascertained he far surpassed them, and that on examining what remains of his works in Santa Maria Maggiore, at Rome, one can hardly be persuaded that they were the production of so rude an age, did not history constrain us to believe it; adding, that it appears probable he took the ancients for his models, and deduced his rules from the more chaste specimens of Mosaic still remaining in several of the Roman churches, the design of which is less crude, the attitudes less forced, and the composition more skilful than were exhibited by the Greeks, who ornamented the church of St. Mark at Venice.

It is common to date the revival of the art of painting in Italy from the time of Cimabue, but the facts stated by Lanzi and several other modern writers, fully prove that before his time there were not only painters in Italy who had made some progress in the art, but that Pisa had a school for each of the fine arts as early as the end of the eleventh century. Guinta, a Pisan, and Guido da Siena were amongst the most important artists, who appeared before the time of Cimabue, and who distinguished themselves by abandoning the tame and formal manner of the Greeks; in which one artist appears to have been content with an imitation of his predecessor, almost with the same precision as was observable in the works of the Egyptians.

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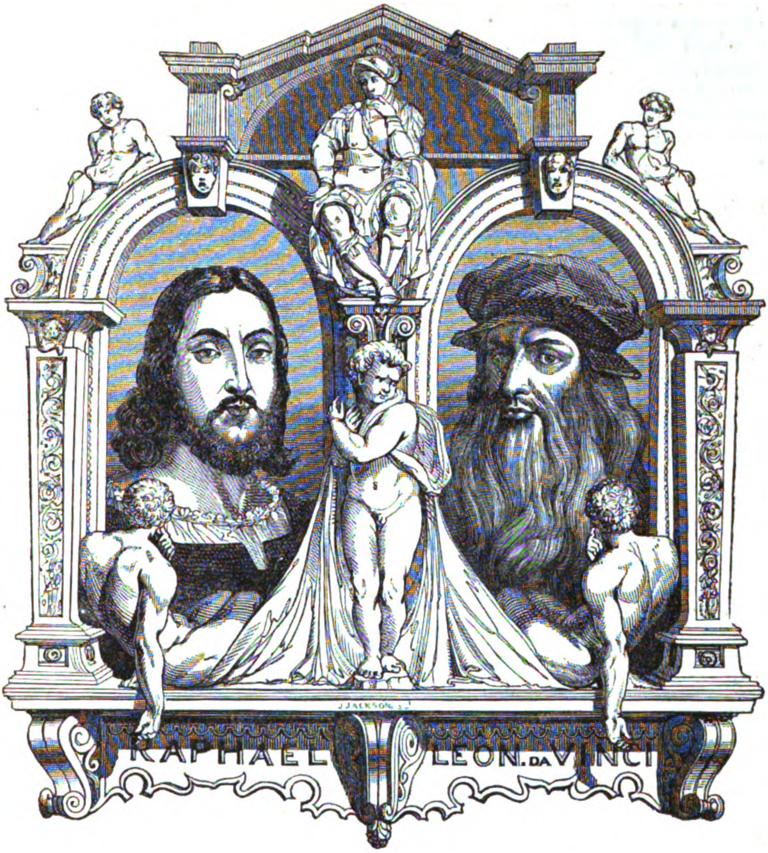
[*] The materials for this chapter have been compiled from the translation by Mr. Thomas Roscoe, of the work of Lanzi, by far the most complete and satisfactory history of painting in Italy which exists.

Giovanni Cimabue was both a painter and architect, he was born about the year 1240. Although it appears probable he originally studied under the Greek artists, who had been invited to Florence, yet he early deviated from their manner. Lanzi observes, he consulted nature, corrected in part the rectilinear forms of his design, gave expression to the heads, folded the drapery, and grouped the figures with much greater art than the Greeks. His talent did not consist in the graceful; his Madonnas had no beauty, his angels in the same piece have all the same forms. Wild as the age in which he lived, he succeeded admirably in heads full of character, especially in those of old men, impressing an indescribable degree of bold sublimity, which the moderns have not been able greatly to surpass. Vast and inventive in conception, he executed large compositions, and expressed them in grand proportions.

Giotto, another name eminent amongst the early painters of Florence, was a shepherd-boy; a sheep drawn by him from nature on a stone attracted the notice of Cimabue, who happened to see it as he was passing; Cimabue, with the consent of Giotto's father, took him to Florence for instruction. Giotto commenced by imitating, but quickly surpassed his master; through him, symmetry became more chaste, design more pleasing, and colouring softer than before: the meagre hands, the sharp pointed feet, and staring eyes, (remnants of the Grecian manner,) all acquired more correctness under him. If Cimabue is to be considered as the Michael Angelo of his age, Giotto was the Raphael. There is much learned controversy as to the share to which the two great Florentine artists, Cimabue and Giotto, are entitled as the founders of the modern school of painting in Italy. The impartiality and ingenuity with which this question has been investigated by Lanzi, entitles him of all others to the merit of being the best authority, and he decides that the improvement in painting is not due to Florence alone; that the career of human genius in the progress of the fine arts is the same in every country. That when the man is dissatisfied with what the child learned, he gradually passes from the ruder elements to those which are less so, and from thence to diligence and precision, afterwards advancing to the grand and select, at length attains facility of execution. Such was the progress of the fine arts in Greece, and such has been that of painting in Italy.

The Pisani (one of whom has been before noticed as a sculptor) and their scholars preceded the Florentine painters, and diffused a new system of design over Italy. It would be injustice, observes Lanzi, to overlook them in the improvement of painting, in which design is of so much importance, or to suppose that they did not signally contribute to its improvement; again, if all the early Italian painters were to be exclusively derived from the two Florentine masters, every style of painting ought to resemble the style of those masters, yet in examining the old paintings of Siena, of Venice, of Bologna, and of Parma, they are found to be dissimilar in idea, in choice of colouring, and in taste of composition.

Lanzi's second proposition is, that if the improvement of painting was not solely due to the Florentines, yet no people excelled or contributed by example so much to the progress of art as they did; that Giotto was as much the father of the new method of painting, as Boccaccio was the father of the new species of prose composition; after the time of the latter any subject could be elegantly treated of in prose; after the time of the former painting could express all subjects with propriety. A Simon da Siena, a Stefano da Firenze and others, added charms to the art, but that they and others owe to Giotto the transitions from the old to a new manner. The services of Giotto were sought by the greatest potentates and families in every part of Italy, and after his death the same universal applause followed his disciples throughout Italy:—thus becoming the model for the students during the fourteenth century, as was Raphael in the sixteenth, and the Carracci in the seventeeth century.



CHAPTER VII.

The revival of Painting from the time of Cimabue and Giotto to that of Leonardo Da Vinci, M. Angelo, and Raphael.

THE works of the Italian writers on the fine arts are filled with long disquisitions on the causes which are supposed to have led to the improved style of Giotto; each party advancing some particular reasons for his theory, though it is evident that the true cause was the discovery and study of the specimens of ancient Grecian sculpture. The effect of these on the productions of the Pisani, and others, (among the first who improved modern sculpture,) is sufficient to show that they were also the principal cause of the change of style in the arts of design and painting. A slight inspection of the works of Giotto manifests how much he was indebted to the newly-found monuments. The secret once discovered, it only required the genius of such a painter to attain excellence. It was not, however, in the Florentine school alone that this improvement is discernible; an examination of the early pictures of the schools of Siena, Bologna, and Parma sufficiently shows that a similar cause was operating nearly at the same time in different places; and the progress of the art was rapid and universal throughout the whole of Italy.

The genius of Giotto, however, formed an era in the rapid advance of the Florentine school; his example incited others to exertion, and his disciples, by availing themselves of his discoveries, and following in his track, assisted in diffusing a knowledge of his principles and improved method; thus laying the groundwork for still higher perfection in the art, though in the capacity of humble imitators of his style.

Amongst the most important of the successors of Giotto, was Masaccio (Maso di S. Giovanni), a name which forms an æra in the history of art. His principles were founded on the works of Ghiberti and Donatello; he had acquired perspective from Brunelleschi, and had long studied the remains of ancient sculpture at Rome. From his works, it is apparent that he had made a great advance in diversifying the positions and characters; and in foreshortening his figures he appears to have studied the anatomy of the body more carefully than his predecessors. The expression of his heads is often graceful and elegant; he exhibits considerable freedom and simplicity in the folds and arrangement of his drapery, and much truth, variety, and delicacy in his colouring. His pictures became the study of all the best artists in his own time, and in that of Pietro Perugino, and of his great pupil Raphael. This artist died in 1443.*

Amongst the imitators of Masaccio, one of the most eminent was Ghirlandaio, the artist in whose school Michael Angelo studied; his works exhibit clearness and purity of outline, correctness of form, considerable invention and facility of expression; and he is considered by Mengs as the first Florentine who, by means of true perspective, was successful in grouping and in depth of composition.

These labours of the Tuscan painters bring us to the beginning of the sixteenth century, when much that was excellent in art had been attained by the careful study and imitation of nature, which had the effect of imparting more variety and life, especially to the heads. Indeed, the artists of later times have not much surpassed their predecessors in this respect. The whole, however, that was accomplished, amounted to little more than a careful imitation; ideal beauty, fulness and grandeur of design, harmony of colouring, aërial perspective, and variety and freedom, were still wanting, in order to carry the art to the perfection which it subsequently attained.

The taste for magnificent edifices having revived throughout Italy, many of the most splendid of those public and private buildings, which still remain at Rome, Florence, Milan, Mantua, and Venice, were erected about this period. The demand for ornamental architecture, as well as for interior embellishments, necessarily created a spirit of rivalry and emulation amongst the artists of the times, and not only tended mainly to the advancement of the art, but probably called into action powers and genius which, at a less fortunate period, would have remained dormant. The schools of Italy, before this attainment of excellence by mutual emulation, strongly resembled each other, but having arrived at maturity, each began to display a marked and peculiar character. This soon became more conspicuous, from the introduction into Italy, about the middle of the fifteenth century, of the art of painting in oil, which enabled artists, in their smaller works, to obtain more brilliancy and depth. The invention of the arts of engraving on copper and wood was also one of the great causes of the advancement of design, by spreading over the whole of Europe the compositions of the great masters, whose works, till then, had been confined to a single spot.

Of the three great artists, whose genius was to bring to maturity all that was excellent in painting, and to expound and simplify the rules of art to their successors, Leonardo da Vinci appeared the first. He was born in 1432, twenty-three years before Michael Angelo. His biographers concur in representing him as "endowed by nature with a genius uncommonly elevated and penetrating, eager after discovery, and diligent in the pursuit not only of what related to the three arts dependent on design, but to mathematics, mechanics, hydrostatics, music, and poetry. He was versed also in the accomplishment of horsemanship, fencing, and dancing. His manners were polished and affable, fitting him for the society of the great, with whom he lived on a footing of familiarity and friendship."

In addition to his great attainments as an artist, he was distinguished as a scientific writer; he was a discoverer in optics and mechanics; his hydraulic works on the Adda, which he rendered navigable for two hundred miles, continue to the present day monuments of his mechanical science. Some general observations contained in his writings, upon the inductive method of philosophizing, are almost couched in the same terms as were the great aphorisms which, in the succeeding age, rendered the name of Bacon immortal.

"Experiment," says he, "is the interpreter of the secrets of nature; it never misleads us. Though our reason may sometimes deceive itself, we must consult experience; and vary the circumstances in our experiments until we can draw from them general rules, for it is from hence that these rules are to be derived." Again, "I am about to treat of a particular subject; but first of all I shall make some experiments; because my plan is to appeal to experience, and from thence to demonstrate why bodies are compelled to act in a certain manner. This is the method to be pursued by such as would investigate the phenomena of nature." His different memoranda on art abound with very useful observations on the mechanical powers and muscular action of the human frame. He was originally taught by Verrochio, an artist of some eminence; he soon, however, surpassed his teacher, though it is remarked that he retained through life traces of his early education, and that, like his master, he designed more readily than he painted; and that in his designs and countenances he seems to have prized elegance and vivacity of expression more than dignity and fulness of contour.

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* The celebrated epitaph on Sir C. Wren, in St. Paul's, was borrowed from that on Masaccio, which is in the Carmelite Church in Rome, the walls of which he had painted in fresco.

"If any one seeks to know my tomb, or name, this church is my monument," &c.

His mode of painting may be divided into two styles,—one abounding in shadow, which gives admirable brilliancy to the contrasting lights; the other more quiet, and managed by merely having recourse to middle tints. In each, the grace of his design, the expression of the mental affections, and the delicacy of his pencil, have not yet been surpassed, or perhaps equalled. He appears, however, to have been more solicitous to advance his art than to multiply his pictures; a kind of timidity, and fastidiousness,—a longing after an excellence which he considered he could not attain—appear often to have induced him to leave his works unfinished, not being able to arrive at that truth which he considered necessary to perfection. In addition to his merit as a painter, he was eminent as a sculptor.

His life is usually divided into four periods; the first during the time he remained at Florence. The second was whilst he was at Milan, where he was invited by Ludovico Sforza, and where he is represented to have delighted every one by performing on a silver lyre (a new instrument of his own construction) no less than by his eloquence and his poetry. Here he remained till 1499, absorbed in abstruse studies and in mechanical and hydrostatical labours for the state. The seventeen years he spent at Milan, were after he had attained the maturity both of his age and fame, as he did not leave Florence before he was thirty. Whilst there, however, he painted little except his celebrated picture of the Last Supper; but, during this period, he raised the school of Milan to great eminence by superintending an academy of the arts, which produced illustrious pupils.

This, and the production of his Last Supper (one of the greatest triumphs of art), render his stay at Milan one of the most important periods of his life. This picture * is well known to all who take the slightest interest in the fine arts, by the celebrated engraving of Raphael Morghen. The picture itself has long been destroyed, but we are fortunate in having in this country (in the possession of the Royal Academy) a very fine copy of it by Oggione, and Sir Thomas Lawrence succeeded in collecting, at a great price, the studies made, as he conceived, by Da Vinci, for the different heads. After the misfortunes of Sforza, Leonardo returned to Florence, and during the thirteen years he remained there, painted some of his best works; and it was at this time that he executed the Cartoon of the Battle, which was designed to rival the work of Michael Angelo. He went to Rome at the time Leo X. became Pope, but remained there only for a short time; and it is stated that it was his procrastinating disposition and disinclination to finish his works, that caused Leo X. to withhold from him his patronage.

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* The history of the misfortunes which led to the destruction of this picture are curious—it was originally painted in oil instead of fresco; and from some defect in the oil or plaster, it soon peeled off, and was at various times retouched and repainted. The refectory of the convent in which it was painted was low and damp: the friars having no great esteem for this production, the middle of the wall on which it was painted being in a line with their kitchen, a door-way was cut through the picture. The chief destruction took place in 1770 by one Mezza, who actually scraped off all the remaining outlines of the picture, and restored heads of his own in all the figures. And in 1796, when the French occupied Milan, the refectory was first a barrack and then for some years a magazine for forage; but notwithstanding this, in the year 1828, we saw a painter mounted upon an immense scaffolding, copying for some crowned head, with great care, this mere ghost of its former greatness. All that is known in reality of the picture is collected from tradition; and through the medium of several excellent copies, some of them by artists of note, who studied the original in the day of its greatest preservation. The one from which the celebrated engraving by Raphael Morghen was taken is from a fresco painted by Marco d'Oggione, in 1514, at the refectory of a suppressed convent at Castellazo, assisted, however, by sketches of Leonardo.

It is remarkable that two judicious critics in this country have both mistaken the subject entirely. Mr. Addison calls it the Feast at Cana; and Mr. Roscoe considers the Saviour as in the act of dispensing the elements of bread and wine, and founding the Sacrament of the Supper.

Francis I., who had seen the painting of the Last Supper at Milan, became desirous of possessing so eminent an artist; and although Da Vinci was then an old man, he invited him to his court.

The rivalry which existed between Da Vinci and Michael Angelo, and, the fact that the latter was preferred to him both at Rome and at Florence, probably induced him to quit his native country with little regret, particularly as, by withdrawing from all cause of excitement and irritation, he was enabled to consult his own ease and happiness. He accordingly went to France, where, however, he expired in 1519, in the arms of his royal patron, before he had employed his pencil in his service.

Raphael de Santi, or Sanzio, the third and last of the great triumvirate, was the son of an inferior painter, and was born at Urbino in 1483. He was early placed at Perugia, under Pietro Perugino, an artist of considerable celebrity, and whose style he in a great measure adopted in his early works; but, like his great contemporaries, he soon surpassed his master, abandoning the stiffness of his draperies, his dryness and harshness, and animating with spirit the gestures and countenances of his heads. The bent of his genius was towards the voluptuous and graceful, and led him to that ideal beauty, grace, and expression which may be considered as the most refined and difficult province of painting. Whilst at Rome he principally studied the remains of Grecian sculpture, by which he perfected his knowledge of the art; and he also devoted much time to the study of the ancient buildings in that city. He studied six years under his relation Bramante, the architect, in order that at his death he might succeed him in the management of the building of St. Peter's. A vivid apprehension, a sort of fervour in seizing the sudden expression of passion, and a facility of execution, seem to have marked his earliest works. The career of Raphael was, however, as short as it was brilliant; yet a careful investigation of his works, in the order of time in which they were executed, shew, even to a common observer, the continued and rapid improvements he made in the highest branches of his art; whilst Da Vinci appears to have been almost paralyzed by hesitation and doubt, and to have been in a constant state of balance betwixt his notions of elaborate finish and want of perseverance. He left behind him but few works during a life of eighty-seven years; whilst Raphael, who died at thirty-seven, in the full vigour of life, left an infinite variety of pictures*. The last, and, perhaps, greatest effort of his genius, is the Transfiguration. Mengs observes, that this contains more excellencies than any of his numerous works. It is well known by the various celebrated and costly engravings which have been made of it. We hope, however, at no very distant period, to furnish engravings of this and others of the most celebrated productions of the great masters, at a price which will enable the most humble to obtain them; so that we may be enabled, by thus diffusing the knowledge, to raise the standard of taste for works of art.

In speaking of the three great masters of painting, who, together, appear to have attained every degree of excellence of which the art is susceptible, the name of Fra Bartolommeo must not be omitted, even in this short notice. "He," observes Fuseli, " first gave gradation to colour, form and masses to drapery, a grave dignity, till then unknown, to execution. If he were not endowed with the versatility and comprehension of Leonardo, his principles were less mixed with base matter, and less apt to mislead him. As a member of a religious order, he confined himself to subjects and characters of piety; but the few nudities he allowed himself to exhibit shew sufficient intelligence and still more style. He foreshortened with truth and boldness, and wherever the figure did admit of it, made his drapery the vehicle of the limb it invests. He was the true master of Raphael, whom his tuition weaned from the meanness of Perugino, and prepared for the mighty style of Michael Angelo.

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* Raffaelle Sanzio was one of the geniuses the most favoured by nature, to whose development the culture and taste of the age, the society of the great men then living, the wise magnificence of princes, and the progress of his predecessors in the fine arts equally contributed. He was inferior to Michael Angelo in the knowledge of the human machine, and in the art of executing possible subjects; but he was superior to all in the execution of subjects of fact, in which he carried the expression of the passions and feelings of the soul to perfection. Thence as Buonaroti strikes the mind, compels it to think and to admire, Raffaello goes straight forward to the heart, overwhelming it with a magical delight, and obliges it to feel, though uneducated and unused to the language of the fine arts. Recognising, however, the excellence of both, each in his line, as men have more heart than mind, and are more touched by fact than by the possible, though sublime, Raffaello has, for three centuries, been deservedly considered as the prince of painting; and if men were differently formed, the crown of supremacy would belong to Michael Angelo. Raffaello was a good architect; he commented Vitruvius, and he is thought to be the author, at least as far as the substance of it, of a beautiful letter to Leo X., on the manner of drawing copies of the antiquities of Rome. He also directed, and perhaps modelled, the statue of Jonas, which is still in Rome, at the Madonna del Popolo.

"Whilst Michael Angelo, Da Vinci, and Raphael had thus raised the character of the Tuscan, Roman, and Lombard schools, Giorgione (Giorgio Barbarelli) first, and then Titian (Tiziano Vecelli,) about the same period, displayed in their works the more alluring charm of colour, thus founding what has been termed the Venetian school. To no colourist did nature unveil herself with that dignified familiarity in which she appeared to Titian. His organ, universal and equally fit for all her exhibitions, rendered her simplest and her most compound appearances with equal purity and truth. He penetrated the essence and the general principle of the substances before him, and on them exhibited his theory of colour." *

The last great advance in art was made by Correggio (Antonio Allegri); he it was who attained that peculiar harmony and grace, which had never before been so fully and strikingly developed; and added a magnificence of breadth and of relief which has been exhibited only by himself. "The harmony and the grace of Correggio are proverbial; the medium by which breadth of gradation unites the two opposite principles—the coalition of light and darkness by imperceptible transition, are the elements of his style: this inspires his figures with grace, and to this their grace is subordinate. The most appropriate, the most elegant attitudes were adopted, rejected, perhaps sacrificed, to the most awkward ones, in compliance with this imperious principle. Hosts vanished, were absorbed, or emerged in obedience to it. This union of the whole predominates over all that remains of him, from the vastness of his cupolas to the smallest of his oil pictures. The harmony of Correggio, though assisted by exquisite hues, was entirely independent of colour; his great organ was light and shade in its most extensive sense. The bland, central light of a globe imperceptibly gliding through lurid demi-tints into rich reflected shades, composes the style of Correggio, and affects us with the soft emotions of a dream†."

Such were the singular effects of genius, that in so short a period raised modern art to its highest pitch. So rapid was its progress, that one enjoying the common term of life, might have witnessed its rise, progress, and decline.

After the works of those who have been mentioned, little was done by the artists who followed, except in refining and ornamenting that which had been struck out by their great predecessors. Whilst Raphael died too early to witness the decline of the art he had so materially assisted to perfect, the long life of Michael Angelo permitted him to see and to lament the perversion of those principles which he had developed.

Amongst the most distinguished disciples of the Roman schools may be mentioned Pelegrino Tebaldi of Bologna, Julio Pipi (Romano) and M.A. Amerigi (Il Caravaggio). The principle of Correggio found no worthy follower except in Parmegiano (Francesco Muzzuoli), who may be said to have refined upon the grace of his master, to a degree of elegance, which, however, was too often allied to weakness and affectation.

Towards the end of the sixteenth century arose at Bologna the school of the three Carracci, known by the name of the Eclectic School, from its leading principle of endeavouring to select the beauties, correct the faults, supply the defects, and avoid the extremes of the different styles; a union which the slightest consideration shews to be entirely incompatible. These principles of the eclectic school speedily caused its decay, and the most eminent of the scholars, such as Domenichino, Schedoni, Guido Reni, and Guercino, soon found their peculiar bias, and followed their own course, unfettered by such inconsistent rules.

As even a short notice of the life of Michael Angelo would have been imperfect without a sketch of the rise and progress of art to excellence, so the singularity of its almost equally rapid decline was too curious to pass entirely without notice; and this must be the apology for the few meagre extracts which have been given from Mr. Fuseli's very spirited notice of the art of the moderns in his second lecture.

CHAPTER VIII.

Character of Michael Angelo as a Sculptor and Painter.

HAVING thus shortly traced the history of painting and sculpture, both ancient and modern, we shall, before we refer to the architectural productions of Michael Angelo, consider his character and rank as a painter and sculptor.

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* Fuseli.

† Ibid.

An estimate of his powers in these two branches of art may be best formed by a reference to the opinions of some of the most eminent writers on art of our own country. Although we may not have produced any artists worthy to contend with the great Italian painters, yet it may be affirmed that no country has hitherto produced writers more fully capable of appreciating the merit and beauties of the Italian school, or of developing the principles of its great masters, than our English artists. Neither Italy nor France has produced works equal to the lectures of Sir Joshua Reynolds, Fuseli, and Flaxman. In general, the Italian and French have wasted their time in antiquarian discussions on minute points, or in subtle metaphysical theories on *beauty*, *ideality*, and *grace*. The paintings of Sir Joshua Reynolds have deservedly placed him at the head of our English school, and his Discourses, taken as a whole, perhaps, place him in the first rank of critics on subjects relating to art. The following extracts, from the lectures of Sir Joshua Reynolds, contain his opinions on the merits of Michael Angelo as a painter.

"When we consider that Michael Angelo was the great archetype to whom Parmegiano was indebted for that grandeur which we find in his works, and from whom all his contemporaries and successors have derived whatever they have possessed of the dignified and the majestic; that he was the bright luminary, from whom painting has borrowed a new lustre; that under his hands it assumed a new appearance, and is become another and superior art; I may be excused if I take this opportunity, as I have hitherto taken on every occasion, to turn your attention to this exalted founder and father of modern art, of which he was not only the inventor, but which, by the divine energy of his own mind, he carried at once to its highest point of possible perfection.

"The sudden maturity to which Michael Angelo brought our art, and the comparative feebleness of his followers and imitators, might perhaps be reasonably, at least plausibly, explained, if we had time for such an examination. At present I shall only observe, that the subordinate parts of our art, and perhaps of other arts, expand themselves by a slow and progressive growth; but those which depend on a native vigour of imagination generally burst forth at once into fulness and beauty. Of this, Homer, probably, and Shakspeare more assuredly, are signal examples. Michael Angelo possessed the poetical part of our art in a most eminent degree; and the same daring spirit, which urged him first to explore the unknown regions of the imagination, delighted with the novelty and animated by the success of his discoveries, could not have failed to stimulate and impel him forward in his career beyond those limits, which his followers, destitute of the same incentives, had not strength to pass.

"To distinguish between correctness of drawing, and that part which respects the imagination, we may say the one approaches to the mechanical (which, in its way too, may make just pretensions to genius) and the other to the poetical. To encourage a solid and vigorous course of study, it may not be amiss to suggest that, perhaps, a confidence in the mechanical produces a boldness in the poetic. He that is sure of his ship and tackle, puts out fearlessly from the shore; and he who knows that his hand can execute whatever his fancy can suggest, sports with more freedom in embodying the visionary forms of his own creation. I will not say Michael Angelo was eminently poetical, only because he was greatly mechanical; but I am sure that mechanical excellence invigorated and emboldened his mind to carry painting into the regions of poetry, and to stimulate that art in its most adventurous flights. Michael Angelo equally possessed both qualifications. Yet, of mechanical excellence, there were certainly great examples to be found in ancient sculpture, and particularly in the fragment known by the name of the Torso of Michael Angelo; but of that grandeur of character, air, and attitude which he threw into all his figures, and which so well corresponds with the grandeur of his outline, there was no example; it could, therefore, proceed only from the most poetical and sublime imagination.

"It is impossible not to express some surprise, that the race of painters who preceded Michael Angelo, men of acknowledged great abilities, should never have thought of transferring a little of that grandeur of outline which they could not but see and admire in ancient sculpture, into their own works; but they appear to have considered sculpture as the later schools of artists look at the inventions of Michael Angelo,—

as something to be admired, but with which they have nothing to do: *quod super nos, nihil ad nos.* The artists of that age, even Raffaelle himself, seemed to be going on very contentedly in the dry manner of Pietro Perugino; and if Michael Angelo had never appeared, the art might still have continued in the same style.

"Besides Rome and Florence, where the grandeur of this style was first displayed, it was on this foundation that the Carracci built the truly great academical Bolognian school.

"This grandeur of style has been, in different degrees, disseminated over all Europe. Some caught it by living at the time, and coming into contact with the original author, whilst others received it at second hand; and being everywhere adopted, it has totally changed the whole taste and style of design, if there could be said to be any style before his time. Our art, in consequence, now assumes a rank to which it could never have dared to aspire, if Michael Angelo had not discovered to the world the hidden powers which it possessed,—without his assistance we never could have been convinced that painting was capable of producing an adequate representation of the persons and actions of the heroes of the Iliad.

"I would ask any man qualified to judge of such works, whether he can look with indifference at the personification of the Supreme Being in the centre of the Capella Sestina, or the figures of the sybils which surround that chapel, to which we may add the statue of Moses; and whether the same sensations are not excited by those works, as what he may remember to have felt from the most sublime passages of Homer? I mention those figures more particularly, as they come nearer to a comparison with his Jupiter, his demigods, and heroes, those sybils and prophets being a kind of intermediate beings between men and angels. Though instances may be produced in the works of other painters which may justly stand in competition with those I have mentioned, such as the Isaiah and the Vision of Ezekiel, by Raffaelle, the St. Mark of Frate Bartolommeo, and many others, yet these, it must be allowed, are inventions so much in Michael Angelo's manner of thinking, that they may be truly considered as so many rays, which discover manifestly the centre from whence they emanated.

"The sublime in painting, as in poetry, so overpowers and takes such a possession of the whole mind, that no room is left for attention to minute criticism. The little elegancies of art in the presence of these great ideas thus greatly expressed, lose all their value, and are, for the instant, at least, felt to be unworthy of our notice. The correct judgment, the purity of taste, which characterise Raffaelle, the exquisite grace of Correggio and Parmegiano all disappear before them. * * * * *

"I feel a self-congratulation in knowing myself capable of such sensations as he intended to excite.' I reflect, not without vanity, that these discourses bear testimony to my admiration of that truly divine man; and I should desire that the last words which I should pronounce in this academy, and from this place, might be the name of—Michael Angelo."—*Sir J. Reynolds's Discourses.*

With respect to the great praises bestowed on Michael Angelo by Sir Joshua, many have been induced to doubt the sincerity of his admiration, seeing that his own works bear so little traces of the style and manner of him whom he considered most excellent. Sir Joshua, however, has himself stated that he was rather to be considered an admirer than an imitator, having taken another course, one more suited, as he modestly observes, to his abilities, and the times in which he lived. That Sir Joshua Reynolds would have been eminent in whatever style he attempted, his great success, and the merit of the works he has left us, give ample evidence. It is in the latter part of his observation that the true reason of the course he pursued is to be discovered. There was no real taste in the country for the grand and severe style of the Roman school; there were no great buildings to be adorned, nothing to call into existence rivalry and emulation such as existed during the times of the revival of the art at Rome; and it was only in the exercise of that branch of art which the public taste made lucrative, that the artist could arrive at that independence which it must be the object of all to attain.

We cannot better illustrate our position, as to the little taste, or, at least, little patronage, those artists receive who exclusively confine themselves to the higher branches, than by mentioning that the late Mr. Flaxman (who, after raising the character of this country by his outlines from Homer and Dante, which the united testimony and applause of all Europe pronounced to approach nearer, in grandeur and simplicity of composition, to the works of the ancients than any other,) never, through a long life, was commissioned to execute one single subject from these designs!

The recently published life of Sir Thomas Lawrence proves to us that he also concurred in giving the palm to Michael Angelo. He observes, in a letter from Rome,—"It often happens that first impressions are the truest,—we change, and change, and then return to them again. I try to bring my mind in all the humility of truth, when estimating to myself the powers of Michael Angelo and Raphael, and again and again, the former 'bears down upon it with the compacted force of lightning.' The diffusion of truth and elegance, and often grandeur, cannot support itself against the compression of the sublime. There is something in that lofty abstraction, in those deities of intellect, that people the Sistine Chapel, that converts the noblest personages of Raphael's drama into the audience of Michael Angelo, before whom you know that, equally with yourself, they would stand silent and awe-struck. Raphael never produced figures equal to the Adam and Eve of Michael Angelo. * * * *

"I passed my morning, for some hours, in the Sistine Chapel and the Vatican; and procured an order to admit me to go round the top of the chapel in the narrow gallery; I thus saw the noble work with closer inspection, and therefore more advantage. With all your love of Raphael, you must and shall believe in the superiority of that greater being, of whom, in grateful, virtuous sincerity, your painter himself said, 'I bless God I live in the times of Michael Angelo.' Admired and popular as he was, it was fine, yet only just in him to say so; and, from frequent comparison of their noble works, I am the more convinced of the entire veracity of Sir Joshua Reynolds's decision in favour of Michael Angelo. I am not used, I hope, to be presumptuous in my opinions about art, but in my own mind, I think I know that Sir Joshua Reynolds could not have had another opinion on the subject."

Fuseli, whose works we have already often referred to, says, "Michael Angelo did for painting what Homer had planned for poetry, the epic part of which, with the utmost simplicity of a whole, should unite magnificence of plan and endless variety of subordinate parts. He in time became *generic*, perhaps too uniformly grand: character and beauty were admitted only as far as they could be made subservient to grandeur. The child, the female, meanness, deformity, were by him indiscriminately stamped with grandeur. A beggar rose from his hand a patriarch of poverty; the hump of his dwarf is expressed with dignity; his women are moulds of generation; his infants teem with the man; his men are giants." Mr. Flaxman, speaking of Michael Angelo, says, "his name was great and venerable, without an equal in the three sister arts; one which became the wonder and example of his own and succeeding ages;" and in his tenth lecture, speaking of his sculpture, he observes:—"The character of Michael Angelo's sculpture is too lofty and original to be dismissed without further notice; although we must acknowledge it has been criticised with severity, because it rarely possesses the chaste simplicity of Grecian art. True, but although Michael Angelo lived long, he did not live long enough to give absolute perfection to all his works; yet the pensive sitting figure of M. de' Medici, in the Medici chapel, is not without this charm; and the Madonna and Child, on the north side of the same chapel, is simple, and has a sentiment of maternal affection never found in Greek sculpture, but frequently in the works of this artist, particularly in his paintings, and that of the most tender kind. The recumbent statues in the monument of Julian de' Medici, in the same chapel, of Daybreak, or Dawn, and Night, are grand and mysterious: the characters and forms bespeak the same mighty mind and hand evident throughout the whole ceiling of the Sistine Chapel and the Last Judgment."

CHAPTER IX.

The critics and censurers of Michael Angelo, with remarks on the various estimates of his genius and character.

IT is one of the evils attendant on genius to be obnoxious to the criticisms of the envious, the ignorant, and the malicious. M. Angelo had his share of detraction amongst those who were jealous of his greatness, in his own time; and there are others of the present time who profess to see no merit in the great works which are yet left to us, and which have gained the applause of ages. It is, perhaps, of little importance to consider either the motives or the capacity of those who have taken on themselves the ungracious task of detraction; but as mere matter of curiosity it may be mentioned, that amongst the foremost of the moderns are Mengs and the Abbé Milizia*. The little work of the latter has become popular in the present day, as affording ready means to the hurried traveller of acquiring, in a given number of minutes, the whole art of criticism in the fine arts. The following may be taken at once as a specimen of the style of the writer, and of the soundness and fairness of his judgment:—

"THE CHRIST OF MICHAEL ANGELO.—Is this really a Christ, or is it a ruffian, who fiercely grasps the cross, for we know not what purpose? The anatomy is very hard; yet it is praised by numbers who think they know how to see, and who esteem Buonaroti as divine.

"In this Christ, in the Moses, and in all his works of sculpture and painting, Michael Angelo makes such a display of his anatomical knowledge, that he appears to have laboured only for anatomy; and unluckily he has neither well understood nor well applied it. The joints are wanting in lightness; the flesh is full, and round in its forms; the muscles are all equally prominent: from which it results that the beauty of motion is wholly lost sight of. No muscle is in repose; which is alone a vast defect. The tendons are of equal size, the outlines sweeping harshly, so that they start forth, and have no passage through which to retire again. What design then, and what elegance! much, indeed, like the labour of those learned persons who heap up all their erudition without discernment, and understand every thing but elegance and delicacy of perception.

"Michael Angelo mistook a means for the end. He studied anatomy deeply, and he did well; he considered anatomy as the ultimate object of the art, and he did ill; nay, he did worse than ill, from not knowing how to make use of it.

"He became (I humbly beg pardon of all his idolaters) sharp, hard, extravagant, overcharged, mean, vulgar, and, what is still more apparent, a mannerist, insomuch that his figures invariably display the same style and the same character. In short, after having seen one, you may be said to have seen them all."

Mr. Payne Knight, amongst our own countrymen, is also a severe critic on M. Angelo, finding in him little to admire. But it may be said of many of those who have underrated his genius, that perhaps they have had but few opportunities of studying those works which they so readily condemn, and that, if it had been otherwise, they would as readily have changed their opinion, as was the case with Falconet, a French sculptor, who was at one time foremost in his censures. When, however, he saw the two statues brought into France by Cardinal Richelieu, he said, with a candour which did him credit, "I have now seen M. Angelo; he is terrific."

The monuments to Giuliano and Lorenzo de' Medici at Florence are perhaps the most remarkable of M. Angelo's works in marble. The statue of Lorenzo is the most remarkable. Lorenzo appears seated, wrapt in thought, leaning his face on one hand, while the rest of the figure is in perfect repose. Of this work, it has been observed, that it bears no resemblance to the antiques; but it rivals the highest excellence of the ancients in point of expression, with repose and dignity of its own. Such effects are produced only by the study of real life, contemplated by genius and imagination.

Mr. John Bell, whose work (Travels in Italy) has been already quoted, has some excellent remarks on the different statues of M. Angelo. Speaking of the tombs of the Medici, he observes:—

"Till I beheld them I had formed no conception of the splendour of genius and the taste possessed by Michael Angelo. They are works which evince a grandeur and an originality of thought, a boldness and freedom of design and execution, unparalleled.

"Two sarcophagi,—those of Lorenzo and Julian,—are each supported by two figures. The personifications of the Twilight and Aurora guard the remains of Lorenzo, and the Night and Day those of his brother. The crepuscule or twilight is represented by a superb manly figure, reclining and looking down; the wonderful breadth of chest and fine balance of the sunk shoulder are masterly, and the right limb, which is finished, is incomparable.

"The Aurora is a female form of the

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* Dell' arte di vedere nelle belle arti del disegno secondo i principii di Sulzer e di Mengs.

most exquisite proportions; the head is of a grand and heroic cast, and the drapery, which falls in thin, transparent folds from the turban, is full of grace, while in her noble countenance a spring of thought, an awakening principle seems to breathe, as if the rising day awaited the opening of her eyes.

"Day is much unfinished—little more than blocked, yet most magnificent. To have done more would have diminished the noble effect of the whole, which is only heightened by what is left to the imagination. Perhaps none but a mind so gifted as that of this great master could have conceived this, or succeeded in so bold an attempt. Genius is creative; and this great artist did not imitate: he meditated, and in his moments of inspiration struck out the most superb inventions, often imperfect indeed, but always grandly conceived. Doubtless the unfinished state in which many of his splendid works were left must have been occasioned by that impatience so often the concomitant of genius, which, having attained its grand object in producing splendour of effect, becomes weary, and forsakes the details.

"The personification of Night*, in sleep and silence, is finely imagined. The attitude is beautiful, mournful, and full of the most touching expression; the drooping head, the supporting hand, and the rich head-dress, are unrivalled in the arts.

"There are in this chapel, forming a part of the group, or at least of the subject, two statues of the brothers Lorenzo and Julian, by the same master. They are both in armour. The figure of Lorenzo is simple and impressive. The whole character of this piece is marked by a cast of gloomy melancholy, which awakens the idea of his brooding over the fate of his murdered brother, their mutual affection being represented by the writers of the day as having been of almost a romantic character.

"The figure of Julian is a noble heroic statue. He is seated, the left hand gloved and raised. The bent forefinger touches the upper lip, which is admirably expressed, seeming literally to yield to the pressure. The helmet, fine in form and proportion, throws a deep shade over the countenance."

"The *Pietà* of M. Angelo at Florence is a mere sketch: he cut his figures out of the block as others would sketch a design upon waste paper, which might prove too small for their intention. The subject is the taking down from the cross. The group is composed of four figures; those of our Saviour, the Virgin Mary, Joseph, and an angel. The whole expression is very touching and mournful: our Saviour forms the principal figure, and seems to hang suspended in the arms of Joseph, who supports the body from above; the figure of the Virgin is seen assisting under the shoulder, to uphold the weight, whilst her face is turned up towards the body. The melancholy of the whole scene is beautifully represented: the head of Christ rests upon her shoulder; the lengthened form of the body, supported in the arms of the assistants, seems extended by its own weight, whilst the suppleness and lankness of recent death is finely marked by the manner in which the limbs hang in gentle bendings, and seem falling towards the ground, with the most natural disposition of the arms, as if affected by every motion. The left arm hangs over the shoulder of the Virgin, whilst the right crosses her neck, and rests on a lesser angelic figure, which might have been omitted without injury to the subject. The interest of the piece lies in the melancholy but placid countenance of our Saviour, and the declination of the head, which is lacerated by the crown of thorns, and seems thus to have drooped in the awful moment when the 'vail of the Temple was rent and the sun was darkened.'"

Mr. Flaxman observes of the Last Judgment, "All is original, and unlike any production of antiquity, and forms a labour that seems scarcely the work of man, and stands without a rival in ancient and modern art."

Again—"In this there are multitudes and legions in comparison with the separate figures and single groups in the most considerable of the ancient works. In this stupendous work, in addition to the genius of the mighty master, the mechanical powers and movements of the figures, its anatomical energy and forms are shown by such perspective of the most difficult positions, as surpass any examples left by the ancients, on a flat surface, or low relief, and are only to be equalled in kind, but not in proportion of complication, in the front and diagonal views of the Laocoon, and all the views of the Boxers, which are both entire groups."

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* Vasari, the friend and panegyrist of M. Angelo, speaking of this statue, says, "Statua non rara ma unica!"

In estimating the character of Michael Angelo, we must judge of him, like Bacon, by his times, and must consider what progress had been made since the revival of the arts; how few ancient statues had been discovered, and how little of the principles of art had been then defined. It is not so much his works that remain; those of his pencil have long lost all their freshness, and most are fast fading to decay; but it is the great and universal change which his genius effected that will make him always illustrious, even when all traces of his own works may have been destroyed. The graceful, the elegant, and the refined style of the ancients could not perhaps be surpassed; but the grand and terrific seems to have been his peculiar province. In invention, vigour, energy of mind, and knowledge of form, he led the way.

It has been objected, and with some truth, that his statues are most of them rather pictures than statues, to be seen in one view only; and indeed most of them were executed for monuments, and not to be seen isolated.

It may fairly be inferred, from the excellence of his Moses and other figures, that, had he confined himself through life to sculpture alone, he would have attained the highest reach of the art. It should also be observed, that his impatience and eagerness did not allow either of his finishing with the necessary care, or of taking the means usually adopted to attain perfection of execution. In a work quoted by the writer, under the name of Baron Stendhal, written in the 16th century, the author observes:—" I myself saw Michael Angelo, when more than sixty years old. His body was thin, and did not give the idea of strength; he was hewing away large pieces of a block of hard marble with such power and dexterity, that in a quarter of an hour he had cut more than three of the strongest young sculptors could have cut away in a whole hour. He worked with such impetuosity and fury, that I expected every moment that the whole block would have been broken in pieces. Every blow brought away pieces of three or four inches in thickness; and his chisel went so near the termination of the outline of the subject, that, if the blow had driven it one line further, the whole would have been destroyed. His impatience was so great, that he often executed his works in marble from small models in wax or clay, trusting to his own resources for the detail."

Many of Michael Angelo's designs were executed by others, particularly by Sebastiano del Piombo, and Daniel da Volterra. With respect to these, it has been observed, that he lowered his imagination to suit the capacity of the colourists, and without losing any of his grandeur or knowledge of design, appears to have avoided those extremes of energetic expression which have laid him open to so much rebuke. With the exception of these painters, who executed works under his immediate inspection, or from designs made by him, he may be said to have had no followers,—none who could be called imitators. His style was one which required his own peculiar genius to attain.

In this short account of the merits and defects of Michael Angelo, we have furnished the reader with the opinions and criticisms of distinguished artists and scholars, who have written on the principles of art and taste, and who, of necessity, have devoted peculiar attention to the works of one who, by almost universal consent, has produced the most wonderful, if not the most pleasing, works of modern art, and most of whom had opportunities of personally studying the original works of this great artist. On a subject depending so much on individual feeling; when, with one, some particular style of excellence is considered as pre-eminent; when, as with Mr. Payne Knight, nothing is excellent which does not convey a notion of ease, and of individual nature; and when with another, as Mr. Fuseli, " the grand " is considered as a compensation for every other defect; and when their very definitions of the terms " beauty, grace, grandeur, sublimity," have afforded discussion sufficient to fill entire volumes,—it would be hopeless to expect any great unity of opinion. None, however, except Mengs and Milizia, have gone so far as to deny great merit to the productions of Michael Angelo; whilst nearly the whole of those best qualified to judge have concurred in placing him at the head of the modern school of art.

If, in weighing the opinions of the admirers and the opponents of this extraordinary man, we have leaned towards those of the former, it is from a conviction that more pains have been taken by them to ascertain the truth, and that their general knowledge and candour appear to have better qualified them to arrive at a just conclusion upon the subject.

CHAPTER X.

Michael Angelo assumes the Direction of St. Peter's.

No one could be more aware of his declining powers as a painter than the aged and noble artist himself, offering, in this respect, a striking contrast to the old age of Titian. In a conversation with his friend and biographer, as already observed, he said that his work in the Pauline Chapel had cost him great fatigue, and that painting, and especially fresco-painting, was not an employment adapted for old men. With the strong good sense which, as well as genius, he possessed, he made no attempt to combat with difficulties which he every day felt himself less able to overcome; and the paintings in the Pauline Chapel were the last he executed. The designs he had made for the remaining portion of the decorations, he entrusted to Perino del Vaga, in whose favour he petitioned the Pope, and obtained for him the honourable office of completing the task which his infirmities prevented him from pursuing.

But it is gratifying to find that this great man continued to feel the same delight in those occupations which had formed the glory of his youth, to the extreme verge of his existence. He had lived in honour and respect, and followed his profession with the ardour of an elevated mind, intent on the acquisition of excellence; and on the termination of his career he retained the inspiriting glow of honest ambition, making none of those complaints by which old age sometimes disheartens the aspirations of youth;—increasing in dignity, but not bartering the cheerfulness and industry of former years for its enjoyment.

Circumstances, indeed, now occurred, which, instead of contributing towards his leisure, tended to introduce him into a sphere of wider exertion than he had hitherto occupied. If his taste as an architect had been amply proved by his works at Florence, it was now about to appear on that splendid scale in which his gigantic genius always shone unrivalled. The Pope had of late frequently called upon him to assist with his advice and experience the pontifical architect San Gallo. The latter, however, seems to have felt a jealousy of what he looked on as interference; and at a consultation which the Pope held respecting the fortifications of the Borgo, in which Michael Angelo differed from him in opinion, San Gallo told him angrily that his arts were sculpture and painting—not fortification! To this the venerable artist replied, that he certainly knew somewhat of the arts he had mentioned; but that with respect to fortification, his study of that science and his long experience in its practice made him believe that he knew more of it than he or any of his class.

But the death of San Gallo, which occurred not long after, not only freed Michael Angelo from the effects of his envy, but induced the Pontiff to select him as the only person fitted to continue the building of Saint Peter's. The artist, who was contentedly employing himself in executing a work of sculpture,—a Christ taken from the cross, at first rejected the Pope's proposal, and for some time succeeded in avoiding the burden which it was intended to impose upon him. The Pope at length changed the expression of his wishes into a command, and Michael Angelo finding himself constrained to accept the appointment, soon entered on his duties with his accustomed energy and alacrity.

It is not the least remarkable circumstance in the history of this great man, as it is certainly one most highly honourable to his character, that the first stipulation he made in yielding to the commands of his patron was, that he should be allowed to accept the appointment without any salary, and that it should be stated in the brief that he undertook the work from a principle of religious devotion. The other conditions which he insisted upon were as strikingly illustrative of his firmness, and of the caution with which he set about so important an undertaking, as the one just mentioned was of his disinterestedness and piety. Among these were a permission to discharge all the officers or workmen employed about the building who were neglectful of their proper business; and, above all, that he should have authority to change as much as he chose, or even entirely put aside the plans of San Gallo.

When Michael Angelo entered upon his new and important office, the cathedral of St. Peter's had been commenced more than forty years, and had already engaged the great talents of Bramante, and the subtle mind and exquisite genius of Raphael. The uncle also of San Gallo and Giocondo da Verona had both had a share in the direction of the work; but notwithstanding this union of men of extraordinary ability, the structure was still in a very indifferent state, and had the complicated model by which San Gallo intended to proceed been followed, it would have been one of the edifices least creditable to modern taste. The contrary was the case with the plan drawn out by Bramante; and Michael Angelo always expressed his high opinion of that architect's ability, and of the system which he had intended to follow in the erection of the cathedral.

But the structure which Bramante proposed to raise could only have been paid for out of funds to be obtained from the contributions of a world; and even Leo X. found himself compelled to submit to having the plans of Bramante somewhat abridged of their magnificence. The reasons which occasioned this necessity for economizing were still more numerous in the pontificate of Paul III., and he therefore prudently resolved upon having such a plan drawn out as might offer a chance of being speedily executed.

The good taste of Michael Angelo fortunately concurred with these ideas of economy. Putting wholly aside the model of San Gallo, which alone, it is said, cost a thousand pounds, he substituted his own design;—a simple Grecian cross, which, though occupying a much less space than San Gallo's, offered greater advantages in point of securing fine architectural results.

Under the constant superintendence of Michael Angelo the building proceeded with all the expedition possible, and the Pope was so well satisfied with the labours of his architect that he employed him in other quarters of the city, and particularly in completing the Farnese palace, and in erecting another on the Capitoline Hill, which he also allowed him to enrich with the numerous antiques which had been dug up in the city or the adjacent parts.

On the decease of Paul III., which took place before the end of the year 1549, Michael Angelo apprehended that his plans, in the execution of which he had begun to take the deepest interest, would be interrupted. If so, he was agreeably undeceived by the courteous manner in which he was received by the new pontiff Julius III., who refused to listen to any of the insinuations made against him by his enemies, and fully established him in the privileges he had possessed under the late pope. Yet, notwithstanding the favourable disposition manifested by Julius, the detractors of Michael Angelo pursued their measures with the most determined hostility, and even contrived to obtain the pontiff's consent to a committee of architects being held respecting the progress of the cathedral. The principal persons engaged in this business were the Cardinals Salviati, nephew to Leo X., and Marcello Cervino, afterwards Pope Marcellus II.

At the conference, the chief objection which these dignitaries started was, that not sufficient light was admitted into the church, a defect principally caused by the improper erection of a wall in front of a recess intended for three chapels, and in which the architect had placed only three windows; and these, it was agreed, were quite insufficient, whether in size or number. The Pope having desired Michael Angelo to explain this apparently strong objection to his proceedings, he observed that he wished to hear the deputies before making any reply. To this remark the cardinals made answer, "That they were themselves the deputies!" "Then," said the architect, "in respect to the parts of the church to which your objection refers, over the three windows already there, are to be placed three others." "You never mentioned that before," was the answer. "No," said the architect, indignantly, "I neither am, nor will be obliged to tell your Eminence, nor any one else, either what I ought or what I intend to do. It is your part to see that money be provided, to guard against thieves, and to leave to me the building of St. Peter's." Then turning to the Pope—"Holy father," said he, "you see what I gain. If the machinations to which I am exposed be not for my spiritual welfare, I am losing both my time and my labour."

Julius, who had sufficient good sense to discern on which side the truth lay, put his hand on Michael Angelo's shoulder, and said, "Be in no fear; you will profit by it, both now and hereafter;" adding to these encouraging expressions fresh assurances of his friendship, and uniformly consulting him in all his future undertakings. One of these was the erection of a bridge over that part of the Tiber which was formerly crossed by the Pons Palatinus. For this work he not only made the necessary designs, but had proceeded a considerable way with the structure, when his adversaries, pretending that such an occupation was too laborious for a person of his age, got his place supplied by Nanni di Baccio Bigio, a man ignorant of his profession, and whose only recommendation was that he could be made more obedient to the cardinals and their associates than his great contemporary. The latter, however, had little ambition to continue superintendent of this work, and willingly yielded to the suggestions of his pretended friends; though he prophesied, on seeing how Messer Nanni di Baccio Bigio was proceeding, that the bridge would tumble in before many years were over, and be washed away;—a prediction fulfilled about five years after it was uttered, and the Ponte Rotto, or broken bridge, as it has been ever since called, still remains as an evidence of Michael Angelo's knowledge, and the ignorance of his rival and of the men who supported him.

Among other designs to which his attention was next directed were monuments which Julius proposed to erect in honour of his uncle and grandfather; and a new chapel in S. Pietro Montorio for their reception. The execution of the designs was entrusted to Vasari, who thereby became a constant and intimate associate of the great artist. The very Boswell of painters, he lost no advantage which this circumstance afforded him to learn the habits, or listen to the remarks of his hero, and his narrative from this period assumes the tone of a man speaking in the company of one whose friendship he is sure of enjoying, but for which he can only be sufficiently grateful by constant and glowing praise. Evidence of this appears in the letters which passed between them, and the manner in which Michael Angelo appears to have received the compliments thus liberally bestowed upon him was marked with equal good sense and kind feeling.

In one of his replies, he says, "As to the three letters I have received from you, I have not a pen to reply to such lofty things; but if I had the good fortune to be in any way what you would make it out I am, I should chiefly rejoice at it, because you would then have a friend of some value to you. But I am not surprised, as you are a resuscitator of dead men*, that you should lengthen out the life of living men, or deliver over the badly living to eternal death."

There was one circumstance in the situation of the celebrated painters and other artists of Rome which in a considerable degree counterbalanced the advantages they otherwise enjoyed. Those great patrons the popes were almost always men far advanced in life before they ascended the pontifical throne. The consequence was, that the painters were repeatedly exposed not merely to individual caprice, but to the caprice of several who appeared successively as the supreme arbiters of their fate. Michael Angelo himself had already lived through the reigns of six popes; and great as he was—possessing all the advantages of indisputable popularity, he had experienced not a few annoyances from the different dispositions and rival pretensions of his masters.

Neither the enlightened Leo X., nor any of his successors, as we have shown, would allow the artist quietly to fulfil the promise he had made to his deceased benefactor Julius II., but would all readily have granted him a dispensation for it. In the reign of Leo, moreover, it is seen how he was neglected and left almost unemployed, and in those of Paul and Julius III. he was several times on the point of being sacrificed to the ignorance and jealousy of vulgar pretenders to knowledge. He had hitherto triumphed over all the difficulties with which he had to contend, and it was reserved for his old age to bear the positive and openly expressed ill will of a Roman pontiff. Julius died in March, 1555, at which time Michael Angelo was in his eighty-first year. The new pope was the Cardinal Marcello, who had long been his declared opponent, and as the artist knew that his engagement with respect to the cathedral was now terminated, he formed the intention of leaving Rome, and once more taking up his abode at Florence. To this he was principally led by the numerous invitations he had received from the Grand Duke Cosmo I., and which, on the death of Julius, were repeated, with the strongest assurances of esteem and friendship.

While Michael Angelo was preparing for his departure, the new pontiff was suddenly removed by death, and Paul IV., who was next elected to the vacant dignity, having manifested the most decided disposition in his favour, he saw sufficient reason to change his intention. The letter he wrote on the occasion to Vasari, who anxiously looked for his arrival in Florence, is strongly expressive of his feelings in respect to his present situation. He had some difficulty, at first, in reconciling the grand duke to the change in his intentions; but the plain statement of the circumstances in which he found himself convinced Cosmo that he could scarcely avoid acting as he had done, and he was accordingly allowed to proceed with the cathedral without any material interruption.

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* See note (6) page 67.

Chapter XI.

Difficulties Michael Angelo had to contend with.

At this period the princes of the Church were exerting their utmost power to crush the spirit of reformation which was daily manifesting itself in the different states of Italy. The means which they employed for that purpose were as contrary to the laws of humanity, as the doctrines which they resisted were agreeable to those of truth. Every government was excited to direct its most severe punishments to the destruction of the unfortunate Lutherans, and scarcely a city was left free from the stain of innocent blood. Divided as the reformers were from each other by the political disunion of the country, they had not been able to make a single stand against their oppressors; and had the latter been disengaged from every other care except that of uprooting the scattered seeds of the reformation in Italy, a very short period would have re-established them in their former security. But all Europe had been thrown into agitation by the changes which had taken place in Germany; the minds of men were prepared for conflict; and when that time arrives with the multitude, it seldom happens that contests of another description do not speedily follow. So marked an influence, in this respect, had the unsettled state of the public mind on the operations of the European potentates, that more than one of them had contrived to lead hosts of men who believed in the infallibility of the pope to attack him in his own dominions, and even in his palace.

The effect of these events was still felt. The Inquisition was yet in full operation, while the authority of the Church itself was shaken to its foundations by the zeal and prosperous situation of the Protestant princes, and by the threatening aspect of Spain. To add to the confusion which prevailed from these circumstances, Paul IV. was bigoted, haughty, and revengeful, and his mind was wholly occupied by the desire of exterminating the party who had incurred his enmity.

It is easy to conceive that a man of this character could possess few feelings in common either with the cultivators or with the real patrons of the liberal arts. Michael Angelo had early proofs of this. Notwithstanding his being continued chief architect of St. Peter's, Paul deprived him, without giving a reason for so doing, of the chancellorship of Rimini, and seriously proposed to whitewash the walls of the Sistine Chapel. When Michal Angelo heard of the latter intention, he bade the persons who told him inform the pope that his wish to amend the picture of the Last Judgment might be easily accomplished, for if his holiness would only reform the opinions of mankind, the picture would be reformed of itself. Fortunately for the admirers of Michael Angelo's genius, the pope only persisted in his resolution to reform, not wholly to destroy, the picture, and a painter of the name of Daniello da Volterra* was accordingly employed to modify such parts of the picture as were deemed by the holy pontiff and his cardinals objectionable.

The warlike rumours which every day grew louder at Rome, and the unsettled state of the public mind, added to the above causes of complaint, rendered the situation of the artist, at this time, extremely disagreeable; and he resolved upon retiring to the monastery of Spoleto till affairs should have resumed a more tranquil aspect. His temporary residence in this secluded retreat afforded him leisure for study and contemplation; and one of the strongest arguments which can be advanced in justification of monastic establishments is, that they have been the frequent asylum of men of genius, when either their own troubles, the disturbed state of their country, or their over-excited feelings, rendered repose and solitude a sort of necessity to restore their exhausted spirits.

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* An artist who, from having been employed in this and other instances in clothing the figures of some of the great artists, was usually known by the name of Daniel the breeches-maker.

Among the mountains of Spoleto, Michael Angelo found the tranquillity he desired; he was constantly surrounded by objects which at once elevated and soothed his expansive and contemplative mind; his age also tended to make the uninterrupted enjoyment of devotional meditation doubly pleasing and valuable; and on his return to Rome, he told Vasari in a letter, that he had received great delight from his visit to the monks in the mountains of Spoleto, and that, though he was returned to the capital, he had left his better self behind him;—there being, he says, no happiness in times so unsettled, except what is to be found in such a retirement.

The influence which this seclusion had upon his thoughts appears to have been still more strongly felt after his return to Rome. The contemplation of death, to a man so naturally serious, must have been long habitual, but he now began to look for its rapid approach, and his chief employment on returning home was the execution of a monument for the chapel in which he was to be buried. The design consisted of a representation of Christ taken from the cross, and supported by the Virgin Mary, who is joined in her pious duties by Mary Magdalen and Nicodemus. This work, it is said, occupied his leisure hours for a considerable period; but unfortunately, after expending upon it great labour, he found that the marble was bad: and not willing that what would probably be his last production in his favourite art should appear imperfect, he ceased from prosecuting it in disgust.

Soon after his return also, a circumstance occurred which put his patience to a still further trial. The pope, influenced, it seems probable, by the party opposed to Michael Angelo, engaged an architect, Pietro Ligorio, to assist him in his labours at the cathedral. This person, however, was altogether a theorist, and the vast field opened to him in St. Peter's offered too great a temptation to a man of his character to be resisted. Scarcely had he entered upon his office when he began to conduct himself towards Michael Angelo with a degree of superciliousness which would have been wholly unwarranted had the venerable old man been indeed in his dotage, but which was the strongest proof Ligorio could have given of his own utter incapacity, when all who were disinterested and free from envy were looking with equal wonder and delight at the gradual developement of the noble plan on which the painter of the Last Judgment had founded the structure, and which he was now rapidly, and without any diminution of the sublimity of his conceptions, bringing to its completion.

To the last hour that the mind of a great man can take an interest in any thing earthly, such an object as that which Michael Angelo had now in view might surely engage his most anxious attention. But in the present case, the exercise of his genius, and the interest which it was natural and right that he should feel in seeing one of the grandest productions of his intellect perfected, had a degree of sanctity given to them by the principles with which he had commenced the undertaking. As if no earthly rewards could be sufficient to repay him at nearly eighty years of age, for the sacrifice of freedom and repose, he refused, as we have seen, to bear the burden, except as a matter of piety and devotion.

This feeling, combined with the desire of seeing his design secure from the contamination of inferior minds, now made the completion of St. Peter's the constant object of all his thoughts; and he was roused to indignation when he beheld the unwarrantable liberties which Ligorio was preparing to take with his plan. As he found that it would be in vain to employ the force of argument with such a man, he appealed directly to the Pope, and at once desired him to decide whether he or Ligorio should remain the architect of St. Peter's cathedral. Paul IV. had sufficient discrimination and justice to decide aright in this case; and the presumptuous Ligorio was dismissed.

Michael Angelo now resumed his occupations with the same steadiness as before; losing, it appears, none of the resolution with which he had begun the undertaking, supported as he was by his high principles of piety and professional enthusiasm. In another letter, written to Vasari about this time, he remarks, that to leave St. Peter's in the state in which it now was, would be to ruin the structure, and thereby be guilty of a great sin; that he hoped he should shortly see the execution of his plans brought to such a point that they could no longer be interfered with, and that this was the prime object of his wishes, "if he did not," he sarcastically observes, "commit a great crime by disappointing the cormorants who were daily hoping to get rid of him." In the same letter he also remarks, "it is God's will that I should still drag through existence, and I know that you will call me an old and silly fellow to wish to make sonnets; but as many people say I am a child again, I like to do childish things. I am convinced by your letter of the love which you feel towards me, and I therefore beg you to know that I should esteem it a most kind office if you would lay these my feeble bones near those of my father."

The state of his mind may be clearly discerned in this short but expressive letter; and the view of such a mind, at all times worthy of the deepest attention, is doubly so when it begins to anticipate the transition to another state of existence, but retains its faculties in undiminished strength and vigour.

Chapter XII.

Progress of the Edifice of St. Peter.

The cathedral was by this time so far advanced, that the thoughts of the architect were now engaged in forming plans for the dome; the splendid frieze and row of double columns from which it was to rise being already completed. His friends were not deficient in offering him their congratulations at the admirable manner in which he had succeeded in bringing his plans to so great a state of perfection; and many of them used their utmost influence to persuade him to proceed immediately with the cupola.

But aware of the importance of this part of the edifice to its general effect, and of the difficulties of executing the noble designs which had been floating in his mind, it was several months before he could determine upon commencing this portion of his labours. At length, however, he overcame his reluctance, and began to form a little earthen model of the dome*. By dint of thought and perseverance, he gradually gave it the appearance which he wished to secure, and then employed an ingenious artist to construct from it another model in wood; all the parts of which were to be formed after the exact measurement he had laid down.

The greatest satisfaction was expressed at the beauty of this model, and Michael Angelo had thus effected another very important step towards the completion of his grand design. His daily declining strength, added to the tardy manner in which the sums necessary for the building were supplied, rendered it hardly probable that he would live to see the cathedral itself perfected. But he had at least the satisfaction to know that the noble idea which had occupied his mind was rightly appreciated by those whose approbation he thought worth his regard; that it had now a real and palpable existence; and that should his plans be put aside after his death, by the envy or bad taste of his enemies, posterity would have the means of doing justice to his conceptions.

Soon after the completion of the model, however, Paul IV. ceased to live, and public affairs underwent another change. The character of the late pontiff had exposed him to almost universal hatred; the zeal with which he had endeavoured to support the church assumed the most terrific forms of private revenge; and while those whom he esteemed his enemies bled under the instruments of torture, the people of his own states groaned under as heavy a yoke as the tyranny of any despot had ever imposed. His death was consequently the signal for the most tumultuous popular rejoicings. In the first excitement, the prisons of the Inquisition were broken open; the intended victims of the holy office set at liberty, and the building itself immediately after burnt to the ground. The people next proceeded to hurl down his statue, which, after rolling with every mark of ignominy through all the principal streets, they cast headlong into the Tiber.

Though he had witnessed many revolutions and strange events, and survived seven pontifical reigns, Michael Angelo had little expected to live to be an eyewitness of scenes like these; so derogatory then to the character of the Catholic church, and which gave to the giant-spirit of reformation an almost irresistible impulse. So great was the confusion occasioned, and the uproar among the people, that four months elapsed before the college of cardinals were able to close their election of another pope. Their choice, however, at length fell on the Cardinal de' Medici, a native of Milan, and no relation of the illustrious family of Florence.

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* It is stated that M. Angelo, when he set out from Florence to build the dome of St. Peter's, turned his horse round on the road to contemplate, once more, that of the cathedral, as it rose in the gray of the morning from among the pines and cypresses of the city, and that he said, after a pause, "Come te non voglio, meglio di te non posso," (Like thee I will not build one, better than thee I cannot.) He never spoke of it without admiration, and he desired that his tomb should be so placed in the Santa Croce, as that from it might be seen, when the doors of the church stood open, that noble work of Brunelleschi.

The new pontiff, on ascending the pontifical chair, took the title of Pius IV. and from the commencement of his reign manifested the most decided inclination to cultivate the arts. The ancient monuments of the city were estimated by him at their true value; the streets were repaired, the churches fitted up with extraordinary care, and the palace of the Vatican was embellished in a style of costly magnificence. Had this pontiff been more enlightened in his general views, and less inclined to amass wealth for the purpose of aggrandizing his family, he would have been a worthy successor of Leo X. Michael Angelo experienced his earliest attention, and was restored by him to the chancellorship of Rimini. Besides this mark of favour he received several others highly complimentary to his genius, and which proved how greatly his talents were still prized, notwithstanding his advanced age and the increasing machinations of his opponents.

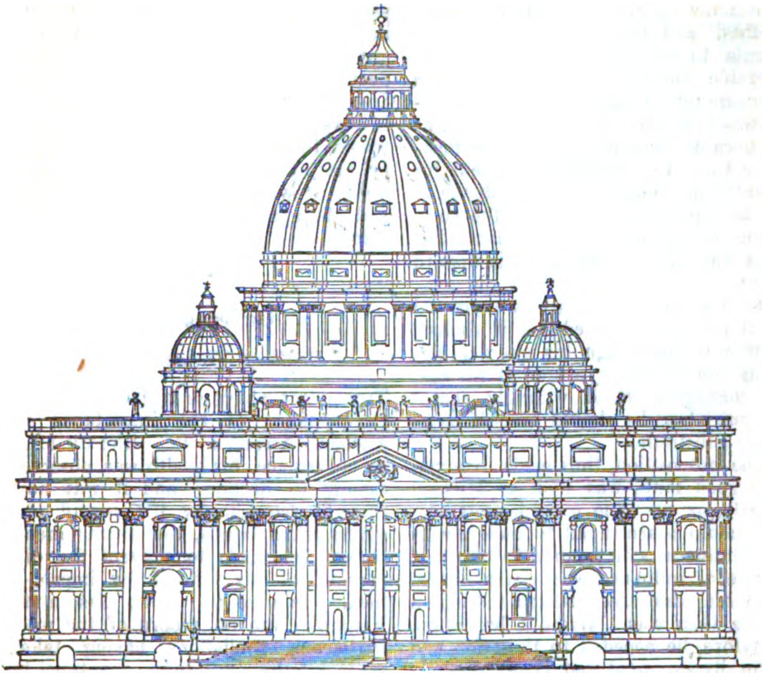
Pius, having formed the idea of rebuilding the gates of the city, directed him to make designs for one which was to be erected without delay. When the drawings were given in, the pontiff fixed on the one which could be followed at least expense, and the celebrated Porta Pia was erected, to his great satisfaction and that of the Romans in general. It is uncertain whether the designs of Michael Angelo for any of the other gates were followed; the façade of the Porta del Popolo has been supposed to afford some traces of his hand; but the most careful antiquarians deny his having had any share in that structure.

Struck with admiration of the powers of the aged sculptor, and eager to gather with as much speed as possible more designs from the unexhausted wealth of his mind, the pontiff employed Michael Angelo in several other works of importance. Among these was a church formed out of the ruined baths of Dioclesian, in constructing which its great architect proved, in an extraordinary degree, the quickness with which his intellect was still capable of conceiving the noblest plans, and the force with which it could overcome the difficulties opposed to their execution. This beautiful church, however, was suffered to fall into decay, and the designs of Michael Angelo were destroyed to make room for those of a more modern artist. About the same period, also, he was engaged by the cardinal, Santa Fine, to build a chapel in the church of Santa Maria Maggiore, but the cardinal dying it was left in an unfinished state. Nor were his labours confined even to Rome. The Florentines, being desirous of re-erecting the church of San Giovanni in the street of Giulia, the three architects employed on the occasion applied to Michael Angelo for a plan, assuring him that, if he refused to comply with their request, the undertaking must be abandoned.

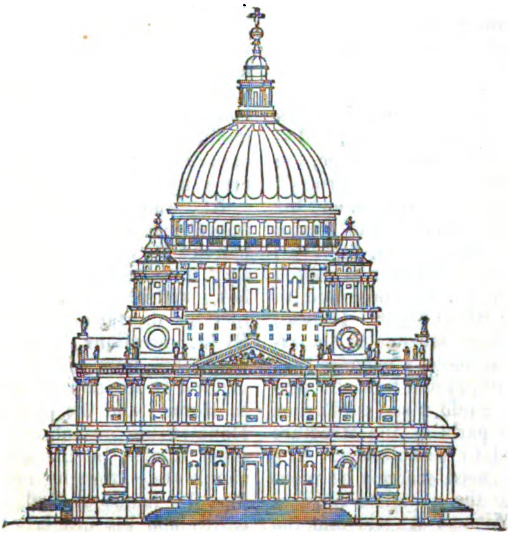
In his reply Michael Angelo told them that he would do whatever lay in his power to further their wishes, both from the natural love which he bore his country, and from his desire now, in his old age, to employ his abilities to the honour of God. His bodily infirmities, however, obliged him to seek manual assistance, though he retained the same vigour in his mental exercises; and he was now in the habit of employing Tiberio Calcagni, a Florentine sculptor to whom he was attached, in drawing out or copying his plans. Having, by the aid of this artist, completed three designs, he sent them to Florence that the directors of the building might make their choice; but their surprise and admiration at the beauty of the plans are said to have been so great that they were unable to decide which it would be best to follow. They, therefore, returned them to Michael Angelo, with a request that he would himself determine the question, to which he immediately assented, observing, that if his design was completed, the structure would surpass anything that had been ever seen by Greeks or Romans, or by any other people.

Unfortunately domestic troubles and difficulties prevented the prosecution of the work, and the model which had been made for the church of San Giovanni, after having been preserved some time, was destroyed.

The building of St. Peter's was in the meantime proceeding with as much speed and regularity as the nature of the edifice and the funds allowed for it would permit. But the opponents of the aged architect had lost none of their jealous ill-will towards a man who so resolutely resisted all the suggestions which their united pride and ignorance prompted them to make. The only argument, however, on which they could safely depend was derived from his old age, and on this they insisted so pertina-



ST. PETER'S.



ST. PAUL'S.*

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* It is proper to state here, that, although drawn nearly to the same scale, the dimensions given to St. Paul's are rather less than the true relative proportions of the two edifices would require.

ciously, that they hoped they were at length on the point of succeeding in their object.

The first step they now took was to send away Luigi Gaeta, one of his assistants, and this provoking Michael Angelo to express himself with considerable warmth, they interpreted his language into a declaration of his willingness to retire. As soon, however, as he became acquainted with the measures they were pursuing, he sent his friend Daniello Ricciarelli da Volterra to the bishop Ferratino, one of the committee of management, to contradict what was alleged respecting his wish to retire.

The bishop, on hearing this, expressed his regret, and observed that if Michael Angelo would resign his charge, certainly too heavy for a man of his age, the managers would willingly accept any one whom he should himself name as his substitute.

The proposition, thus made in apparent good faith, was such as Michael Angelo, or even the most jealous person, could scarcely fail to receive with good humour, as it secured to him that degree of influence which was almost everything desirable, situated and infirm as he then was. Without hesitation, therefore, he acceded to the offer, and naturally supposed that Daniello would be immediately appointed his substitute; but the bishop, instead of acting according to his promise, presented Nanni Bigio to the committee, simply mentioning that Michael Angelo had agreed to appoint a substitute.

The venerable architect heard of this transaction with mingled anger and disgust, and hastening to the pope, he expressed his determination to proceed instantly to Florence, and there end his days, if his holiness would grant him a licence to leave Rome. Pius, however, sought in the kindest manner to soothe his irritated feelings, and promised to inquire into the whole affair. Instead, therefore, of giving credence to the assertions of the architect's enemies that he was ruining the edifice, he sent a person in whom he could place confidence to examine the parts of the structure which were said to be defective. The investigation, it need scarcely be mentioned, ended to the complete satisfaction of both Michael Angelo and the Pope, and Messer Bigio was once more driven away in disgrace.

It is impossible to contemplate, without indignation and regret, the persecutions to which Michael Angelo's inflexible integrity exposed him. The greatest genius of the age, advanced in years, bestowing gratuitously his talents in the erection of a fabric unrivalled in any age, was persecuted by every crafty peculator who found himself thwarted; and the directors of the works, wishing to have under their guidance some one whom they could more easily control, or make subservient to their own dishonest views, repeatedly annoyed him, and brought false charges against him.

Chapter XIII.

Death of Michael Angelo.

The event above related was the last circumstance of any importance in Michael Angelo's life. Shortly after its occurrence, his health was observed rapidly to decline; and it was now thought requisite by the pontiff and others of his friends, that arrangements should be made to prevent the dispersion of his effects by improper means, in case of sudden dissolution. Examples are on record of the most barbarous spoliations having taken place on the death of eminent artists, among which what occurred on the decease of Titian is not the least memorable; and from the vast quantity of valuable designs, pieces of sculpture, and antiquities, which were accumulated in Michael Angelo's house, it was feared lest the rapacity of his attendants might deprive his rightful heirs of their expected inheritance, and the lovers of art of many valuable relics.

At the beginning of the year 1563, the apprehensions entertained from the impaired state of his health were considerably increased; a slow fever assailed him; and he became conscious himself that his mortal career was at an end. By his directions, Daniello da Volterra wrote off immediately to desire his nephew Leonardo to come with all haste to Rome; and the physician Federigo Donati being present, with several of his other friends, he made his will, which simply stated that he resigned his soul into the hands of God, his body to the earth, and his property to his nearest relations. He closed his brief testament with the exhortation, that in their journey through life they should remember the passion of Jesus Christ. Shortly after thus disposing of his possessions, he expired, his death happening on the twenty-third of February, 1563, when he had completed within a few days the eighty-ninth year of his age.

The conspicuous station which M. Angelo had now for so long a space occupied, rendered his decease an event of considerable importance, and Florence disputed with Rome the honour of possessing his remains. They were, however, deposited, three days after his death, in the church of the Apostles at Rome, the Pope at the same time expressing his resolution to remove them at some future period to St. Peter's, and erect a monument over them worthy of the great artist's fame; "a circumstance," observes the editor of Vasari, "sufficient of itself to show the height of honour to which Michael Angelo had arrived, as it was the pontiffs alone who were usually interred in the cathedral."

The intelligence of his interment was no sooner received at Florence, than the academy of that city held a sitting to consider by what means it might prevent the remains of one who had so greatly increased the honour of the Florentine name from reposing in a distant province. A committee was accordingly chosen with a president of considerable reputation, Vincenzo Borghini, to arrange the preliminaries necessary to their design. The persons selected to represent the academy were Agnolo Bronzino, Giorgio Vasari, the biographer; the celebrated Benvenuto Cellini and Bartolommeo Ammanati. Having finished their consultations on the subject, they resolved upon petitioning the grand duke to obtain the pope's consent that the body of Michael Angelo might be transported to Florence, and deposited in the church of San Lorenzo, which contained the greater part of the noble works executed by the divine artist in his native country.

Their petition to the prince expresses in a striking manner the veneration with which the memory of Michael Angelo was regarded. "The academy and company of painters and sculptors," it says, "having consulted among themselves how, agreeably to the satisfaction of your excellencies, they may in some manner honour the memory of Michael Angelo Buonaroti, to whom it is due, both on account of his excellence in their profession, he having been the greatest artist the world ever saw, and because of their common country, they are unanimous in desiring that this should be done in the noblest manner, and to the best of their power. They have therefore made known their sentiments to your excellencies as their most certain refuge and aid. To this address, the latter part of which abounds in compliment to the grand duke, the latter replied, that the readiness which the academy had shown to honour the memory of Michael Angelo gave him great happiness, and that he was not only willing to do that which had been requested in the memorial, but would endeavour to obtain the removal of his body to Florence.

This letter of the duke's produced another address from the academy, in which they thanked him for having employed his orator at Rome to secure the object of their wishes, and begged him to appoint Benedetto Varchi, a distinguished man of letters, to pronounce a funeral oration in honour of the deceased artist. These requests were also immediately granted, and the body, being privately conveyed to Florence, was placed at the foot of the great altar of San Pietro Maggiore. On the following day, all the sculptors and painters of the city were assembled in the church at an early hour; and about midnight the whole of the spectators having surrounded the coffin, the oldest and most celebrated of the artists present suddenly held up the numerous torches which had been prepared for them, and the young men raised the bier, all eagerly endeavouring to assist in the obsequies of so renowned a man.

The church of Santa Croce had been finally destined to receive his remains; and as they were conveyed thither, the streets were crowded by immense multitudes, all loud in their expressions of love and admiration for the sublime genius who had so greatly contributed to the glory of their city. When the procession arrived at the church, it was with the utmost difficulty the bearers could make their way through the concourse of spectators; but this being at last effected, and the funeral service having been performed by the friars of the establishment, the body was deposited in the sacristy, where the president of the academy, expressing his wish to see the deceased, whom he had not beheld for so many years, that he had forgotten his person, declared his intention to open the coffin.

All present coincided with him in the feeling which had prompted him, and the covering was removed from the remains of the immortal artist. It was feared that, as he had now been dead twenty-five days, considerable change might have taken place in his appearance, which would have prevented his followers from contemplating his inanimate form. But on the lid of the coffin being removed, he was seen lying as in a serene and quiet sleep, no other difference being visible in his countenance, but that it wore a paler aspect.

The ceremonies, however, necessary to complete the funeral honours of Michael Angelo were not yet ended; and some weeks after, his solemn obsequies were performed in the church of San Lorenzo, where a magnificent catafalque or monumental pile was raised in his honour by the united abilities of the Florentine sculptors and painters. Some idea may be formed of this structure, when it is mentioned that it was twenty feet by seventeen at its base, and more than fifty feet high; and that from its base to its top it was surrounded by paintings and statues representative or emblematical of the events in Michael Angelo's life, or of the triumphs he had effected in his favourite arts.

This remarkable catafalque occupied the middle of the great nave in the church, which, on the day the ceremonies took place, was hung with black, and illuminated in the most splendid manner, not merely the body of the building, but every chapel being decorated with paintings and other ornaments in honour of the deceased. The mass for the dead was performed, amid these manifestations of public respect, with all the pomp and solemnity of which that impressive though vain ceremony is capable; and at its conclusion Benedetto Varchi ascended a platform erected for the purpose, and pronounced the funeral oration, an honour so great, that, according to Vasari, Michael Angelo might consider himself fortunate to have died before Varchi, thus to enjoy the reward of his grand and eloquent discourse.

The splendour with which these rites were performed was an apt emblem of the reputation which Michael Angelo possessed during his life; and it would be difficult to name an artist, in any period of the world, or of any country, who more richly deserved, to the very utmost, that celebrity which he attained. The peculiar style which his genius, and both his moral and intellectual character led him to adopt, was wholly removed from that which, by flattering popular tastes, may secure for its cultivators a rapid and easily earned reputation.

Chapter XIV.

Conclusion of the Character of Michael Angelo.

In whatever this great man undertook, we may discern the aspirations of a powerful mind struggling with the difficulties which, by the nature of things and the circumstances of age and country, presented themselves in formidable array before his bold discursions and discoveries in the regions of human art. Nothing less than his mighty genius could so far have outstripped the times in which he lived, and by his grasp of intellect, have reached the consummate perfection which distanced all living competition, and rendered his predecessors and successors alike the satellites of one majestic luminary. Difficulties, long insurmountable to other minds, he confronted and triumphed over with the daring inspired by the conscious strength of gigantic intellect. The Homer of painting, he seemed to belong to some higher and grander world; and to draw from sources of joy and woe, far above the level of mere humanity as it is felt to exist.

It was thus the admiration he gained by his works became as universal as it has been lasting. If he ever incurred failure, it seems to have been in consequence of allowing his art to overstep the modesty of nature by the fire of his genius, and hence his mannerism whenever it obtrudes itself somewhat too glaringly on our notice; hence his studied display of anatomical science, and his fondness for sporting with difficulties which sometimes led him to the brink of absurdity itself. Whenever this was not the case—when he trusted to his own free conceptions, and was content to express them, as well as the instruments with which he had to work would allow, the productions of his pencil and of his chisel partook of an almost supernatural grandeur and sublimity; the forms under which he embodied his ideas were marked with fearful strength, because the natural offspring of his mind could not be otherwise than characteristic of power; and the composition of his subjects was distinguished by a mingled severity of thought and boldness of invention, which, tempering each other, prompted him to depict the awful scene of the Last Judgment, but to reject in so doing any appeal to our more ordinary sympathies.

It was from a perfect consciousness of the advantage which his mind possessed when working with as much freedom as possible from whatever injures the simple expression of sublimity, that he felt so decided an aversion to painting in oil, which he denominated an employment only fit for women; and it was probably to the same cause that he owed his early predilection for sculpture, as better calculated than the sister art to express the feelings and ideas in which he delighted. Certain it is that in all his works we may discover a noble struggle to emancipate art from the accidents of fashion and human caprice; an endeavour solely to employ it as a medium of lofty and unchanging truth. No attempt was ever made by him to supply a want of essential beauty in natural forms by the skilful management of drapery, or any of the trickeries of art. He sought no aid from the gorgeous attractions of colour, or even from the austerer effect of light and shade. Whether the materials he employed were marble or colour, he never allowed them to appear but as the true materials of his art.

The only respect in which Michael Angelo put himself occasionally on a level with artists of inferior genius was by suffering the boldness of his manner to degenerate into what the French critics term "the fierceness of his line;" not always what Agostino Carracci means by—

"Di Michel Angiol la terribil via,"

but a degree of extravagance springing from the very exuberance of his powers. His most zealous supporters indeed cannot vindicate some of his productions from faults of this nature; and great exceptions have been very generally taken to the harsh and obtrusive figures he has not unfrequently introduced into his compositions, apparently from the desire, as was before said, of displaying his anatomical knowledge—a sort of ambition creditable to a young academician, but to which a man of such resplendent genius would soon, we should suppose, have risen superior.

It is not, however, only by reference to his particular productions that the greatness of Michael Angelo's genius is to be judged. The facility with which he passed from the exercise of one branch of art to that of another proves how unrestricted were its energies, how comprehensive an idea he had formed of nature, and how rapidly he could make himself acquainted with all the modes by which her external forms may be imitated, or her more mysterious operations typified. Sculpture, painting, architecture, and poetry, were all exercised by him with noble success, and were all made the medium of conveying to the world a great and elevating class of sentiments. In his moral and personal character he was equally noble and superior to the rest of mankind. His heart was strongly susceptible of affection, and he delighted in both writing and conversing on the subject of love. Yet Condivi observes, that, in his long intimacy with him, he never heard him speak in any way which did not tend to extinguish every lawless and vicious passion.

Independence,—so difficult for a man to preserve whose fame and fortune depend in a considerable degree on the favour of the great—distinguished both his conduct and sentiments to the latest period of his life; and it was in solitude, rather than amidst flattering assemblies, that he sought for the inspiration which raised him to eminence.

The other habits of Michael Angelo's mind correspond with these, and to his singular temperance, both in youth and manhood, he attributed his power of studying for a greater number of hours than most of his contemporaries. A little bread and wine was all he required for the chief part of the day when employed at his work. Very frequently he rose in the middle of the night and resumed the labours of the day. When he did this, it was his practice to fix the candle on the summit of a pasteboard cap which he wore, in order that he might not interrupt the light by his hands. He would often also sleep in his clothes, that he might be ready to proceed to work as soon as he rose, and sometimes would do so from having wearied himself too much to undress. Sir Joshua Reynolds, who, with as much admiration as Vasari himself for the object of our memoir, loved to expatiate on the excellencies of his character, has not omitted to point out his industry as worthy of imitation by artists of all ages.

Chapter XV.

Character of Michael Angelo as an Architect.

In his capacity as an architect, M. Angelo was extolled for his judicious selection of the sites of his buildings, and for bringing into compositions of harmonious strength and beauty, objects which lay beyond the immediate sphere of his operations. He completed all he began with the hand, not only of a master but of an artificer, embracing, with that commanding genius which belongs only to the giants of their race, the most extended bearings, and the minutest details of his subject, with the same tenacity of idea. By principle, however, Michael Angelo was both practically and theoretically devoted to the Greek architecture; and it was chiefly when called upon to alter and re-model the vast and rudely-designed works of the preceding periods, that he adopted the plan of mingling the Greek and the Tuscan styles. He was in so far a passionate admirer of the purest and most simple forms of the ancient orders, that he almost invariably placed flat pilasters on the fronts of his buildings, and these were principally Doric. He was most of all opposed to the more gorgeous and ornamental style, though unequalled in point of invention and sportiveness of genius. It was hence his architectural labours appeared to so much advantage—at once various and severe in their character; and in his palaces and private residences, he always succeeded in combining chasteness of manner with simplicity and ease. The knowledge he displayed was the more extraordinary, from the fact of his having directed the powers of his mind least of all to that branch of art; and entered upon it extremely late in life. He was, moreover, self-taught, having never received professional instructions from any master. On this ground, probably, when the Pontiff Paul III. invited him to take the direction of St. Peter's, he more than once begged to decline the undertaking. Architecture was not, he declared, his profession; and, on a former occasion, when he had repaired purposely to Florence, in order to construct the façade of the grand church of S. Lorenzo, he only yielded to the express injunctions of Pope Leo the Tenth. Next to the Laurentian Library, perhaps the most beautiful and admired of his productions, although one of the earliest specimens of his skill, was the Chapel of the Medici, intended as a mausoleum for the family. In the new Sacristy were placed the monuments of Giuliano and Lorenzo de' Medici.

But the master-piece of his labours in this art, was the cortile of the Farnese palace, before alluded to, with the projecting cornice surrounding the exterior. The galleries on the Capitoline Hill are thought to be too complex, and the least correct specimens of a good style. It is asserted, indeed, that, even in the times of Michael Angelo, the remains of ancient architecture were not thoroughly understood,—an assertion which is not, however, supported by any sufficient show of reasoning—and much less by anything amounting to proof. On this ground, Mr. Duppa, rather too hastily we think, censures Michael Angelo, detracting from the character and importance of his labours on account of his not having sufficiently freed himself from the prejudices and trammels of his predecessors. "The chequered black and white marble of Brunelleschi," he observes, "in the exterior of public buildings, was the fashion of his day, and whatever partook of novelty in its appearance had sufficient claims to public approbation. Notwithstanding his taste and style of design were very little conformable to ancient simplicity, it was the misfortune of Michael Angelo to consider him as worthy of imitation." . . . . "The taste of Michael Angelo appears to have been misled," he continues, "by some previous associations, which it would now be in vain to seek. In a letter addressed to a gentleman who had probably made some inquiries on the subject of architecture, he has expressed this singular opinion: 'that ability in that art depends upon a knowledge of the human figure, and more especially upon anatomy.'"

Had the writer of the above inquired a little more deeply into the nature of the subject on which he hazards so decided an opinion; had he consulted the best authorities, and read the best books upon the art, he would not have considered it so very singular an opinion of Michael Angelo's, and one derived from mere prejudice and error. That such an analogy does exist—that a knowledge of the human figure—its mutual supports—its connexion—and gradations, is no unnecessary study to the architect, may be shown on the simple principles of analogy. Neither the older critics and commentators on his works, nor the modern Reynolds, Opie, Fuseli, and Flaxman, have ventured to criticise the great artist for too close an attention to the anatomy of the human figure. The reader, however, will form his own judgment with less difficulty on this head, when he has perused the letter in question, from which Mr. Duppa would seem to infer that the artist showed a want of discernment in not perceiving what he considers the utter inapplicability of the principles of the one study to the practical employment of the other. Michael Angelo's observations on the subject are as follow:—

"Most Reverend Sir,

"When a design in architecture has different parts, all equal, and of the same character, the decorations ought to be of one character also, and executed in the same style; and the same rule is to be observed in corresponding parts. But when the design is entirely changed, it is not only allowable, but necessary, to change its decoration; and the same principle is to be observed in the parts which are meant to correspond: the architect, however, always having full liberty to choose for himself, in the first instance, the style of ornament best adapted to his purpose. The nose, for example, in the middle of the face, does not depend upon the one eye or upon the other; but it is necessary that the one hand should be like the other, and that both the eyes should correspond, as well with respect to each other, as to the parts of the face in which they are situated. It is also certain, that the members of architecture have a reference to those of the human body; and he who does not understand the human figure, and particularly anatomy, can know nothing of the subject.

"Michael Angelo Buonaroti."

The talents of Michael Angelo as a military architect were made known by his admirable defence of Florence against the imperial troops commanded by Philibert prince of Orange; a subject alluded to in the narrative of his life. Of his general excellence in the art we cannot finally convey a more correct idea, than is given in the few brief words of Fuseli: "The fabric of St. Peter, scattered into an infinity of jarring parts, he concentrated, suspended the cupola, and to the most complex, gave the air of the most simple of edifices. Such, take him all in all, was Michael Angelo,—the salt of art."

Chapter XVI.

Of the Poetry of Michael Angelo.

Michael Angelo observed that painting has the greatest resemblance to poetry: whence by many oftentimes the one has been called *mute poetry*, and the other *speaking painting*; and the close friendship in which we continually see painters and poets united, (like that between Giotto and Dante, or that between Petrarch and Simon of Siena,) is not a slight proof of this alliance or sisterhood of the arts. In the same manner, many poets have been endowed with the art of painting, as, for example, Cratinus, a comic poet, Dante, and some of our own times; amongst whom may be mentioned Pope, who had the finest feeling for art, which is traced throughout his works, particularly in his beautiful epistle to Jervas, in which he has so well described the characters of the different great painters. To the name of Pope might be added that of others of less distinction. This companionship of the arts of poetry and painting arises not only from the advantages which the one often derives from the other, but from the union which naturally subsists between them,—that is, that each is an imitation of nature. M. Angelo himself was an example of his own position respecting the close alliance between the arts of poetry and painting; and he who had surpassed all of his time in that mute poetry, also produced many beautiful verses, some of which have come down to us, while others have been lost. Like Petrarch, of whose poetry he was an imitator, his muse was inspired by a mistress; and, like Parrhasius of old, he charmed the hours of labour by singing to the pure celestial *Venus*. The object of his muse was one entirely worthy of the worship of so great a man: Vittoria Colonna was the wife of the illustrious Marquis of Pescara, who died of the wounds he received at the battle of Pavia. At the time when the princes of Italy, in great alarm, sought to lead Pescara from his fidelity to the Spanish cause, she wrote to her husband, "Remember your honour, which raises you above fortune and above kings; by that alone, and not by the splendour of titles, is glory acquired; that glory which it will be your happiness and pride to transmit unspotted to your posterity." After the death of her husband, she betook herself to solitude, that she might lament his loss and celebrate his exploits. Young, and of consummate beauty both of mind and person, she uniformly refused to accept a second husband, though sought in marriage by persons of high distinction. She devoted herself to poetry, and so general was her fame throughout Italy, that Ariosto inscribed several of his verses to her. But her peculiar merit as a poet was, that in an age of immorality and grossness, she was the first who consecrated her lyre to subjects of piety unmixed with other matters. To such a person it was that Michael Angelo devoted his soul and his muse. It does not, however, appear whether or not she felt any answering affection, though it is observed by an elegant artist, that he thinks some traces of such a correspondence appear in his poems*. It is however certain that she wrote to him frequently letters of warm regard, and that she many times went to Rome expressly to see and converse with him, openly avowing the pleasure she received from his society; but in the poems of Vittoria Colonna, not a tinge of passion is discernible, though it glows with infinite ardour and tenderness in those of Buonaroti.

The Italian poets of the time amused the multitude, and were admired by them because they made their poetry subservient to levity and gross representations. Michael Angelo, however, did not follow their example, but trod in the path of Dante and Petrarch, his great masters. The platonic notions relating to the doctrine of the immortality of the soul, entirely imbued the minds of the masters of this school, at the time when the fine arts and poetry came forth out of the deep darkness which had shrouded them. It was the object of these men to draw love from the slavery of the senses, and to place it under the guidance of reason; not representing its exterior acts and sensible enjoyments, but delineating that which arises in the minds of the good alone, when this, like other affections and passions, is purified and made conformable with virtue. From this cause, neither the works of Dante, Petrarch, nor Michael Angelo received applause except from the learned and good, and more particularly those whose minds were filled with the platonic conceptions of love. It should be observed that Lorenzo de' Medici, Michael Angelo's great and early patron, had drawn around him a society of platonic philosophers consisting of the most celebrated men of his time, and had caused Plato's dialogues to be translated; and it is probable that their doctrines concerning the power of the soul's energies in the configuration of the countenance and person, according to the established habits of virtue and vice, tended at once to awaken the attention of Michael Angelo in his choice of subjects and expression of qualities for the perfection of beauty, and also to imbue him with that peculiar spirit which is apparent in his writings. The following sonnets by Michael Angelo, which have been translated by Mr. Wordsworth, will illustrate the doctrine of this school.

No mortal object did these eyes behold
When first they met the placid light of thine,
And my soul felt her destiny divine;
And hope of endless peace in me grew bold:
Heaven-born the soul a heaven-ward course must hold;
Beyond the visible world she soars, to seek
(For what delights the sense is false and weak)
Ideal form, the universal mould.
The wise man, I affirm, can find no rest
In that which perishes; nor will he lend
His heart to aught which doth on time depend,
'Tis sense, unbridled will, and not true love,
Which kills the soul: love betters what is best
Even here below, but more in heaven above.—

Yes hope may with my strong desire keep pace,
And I be undeluded, unbetray'd;
For if of our affections none find grace
In sight of heaven, then wherefore hath God made
The world which we inhabit? Better plea
Love cannot have, than that in loving thee
Glory to that eternal peace is paid,
Who such divinity to thee imparts
As hallows and makes pure all gentle hearts.
His love is treacherous only whose love dies
With beauty, which is varying every hour,
But in chaste hearts, uninfluenced by the power
Of outward change, there blooms a deathless flower
That breathes on earth the air of Paradise.

Wordsworth.

In all Michael Angelo's compositions traces of his admiration of Dante are to be found; it is stated that he knew the Divina Commedia by heart;† "and whoever" (observes Sig. Radici) "has meditated on the productions of these two extraordinary minds, will be constrained to confess that never did two souls agree with so perfect a harmony—whether we look at the awful and terrible nature of their imagings, or at the loftiness of their sentiments, or at the perfectness of their representations, the thirst for renown, the consciousness of their own worth, the scorn of the blind vulgar, a constant dissatisfaction of things appertaining to this world, and an incessant panting, and, as it were, striving after the mysterious beatitudes of heaven, which may be seen a thousand times in the writings and in the lives of both these illustrious Italians. The deep contempt in which the lofty mind of Dante held the vulgar is apparent in every part of his writings. By the vulgar, however, he did not mean the simple inhabitants of lonely streets or humble cottages, but that abject and sordid crowd of all classes and all places,—the vulgar of kings, of popes—to whom he allotted punishment, not so much for their crimes, as for the baseness of their minds and the meanness of their desires—of priests, of nobles, of plebeians, of learned men, of knaves—the vulgar of every degree.

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* See a very eloquent article by Sig. Radici on the poems of Michael Angelo, vol. xiii. p. 248. of the Retrospective Review. It is to this article, and to Mr. Duppa's life, that we are indebted for what is stated of the poetry of Michael Angelo.

† Monsignor Bottari, in his life of Michael Angelo, mentions that he had a copy of Dante in his possession, (the large folio edition with Landino's commentary,) on the margins of which he had drawn with a pen every thing which was contained in the poems

"It is the fate of lofty genius, like that of Dante and Michael Angelo, to be unable to support the scoffs and restraints imposed by the multitude; who, often malignant, and offended by greatness, try to fetter and deride it, calling those actions which their grovelling minds cannot understand, madness.

"Indeed it seems to have been the peculiar hard fate of him and his contemporaries, who were to become in after times the great ornaments of their age, and the glory and pride of their country, to have experienced little else than continual opposition and oppression. Tasso, after living forty-seven years in the midst of the railleries of courtiers, the dulness of pedants, and the haughtiness of princes, at one time imprisoned—a wanderer—always indigent—lying on his death bed, wrote, 'I will not complain of the malignity of fortune, because I do not choose to speak of the ingratitude of men who have succeeded in dragging me to the tomb of a mendicant.' Dante for many years went begging from door to door; he whose noble verse had aroused Italy from her slumbers, and breathed into her a new and nobler soul; he who in his youth had drawn his sword in the sacred cause of his country's liberty; he who was overcome with longing after the paternal roof—an exile—was not permitted to behold again the towers of his native city, nor to embrace the tomb of his ancestors even in death:" and Michael Angelo, in one of two fine sonnets to the memory of Dante, has indignantly noticed his country's cruel injustice.

SONNET.

How shall we speak of him, for our blind eyes
Are all unequal to his dazzling rays?
Easier it is to blame his enemies
Than for the tongue to tell his lightest praise.
For us did he explore the realms of woe;
And at his coming did high heaven expand
Her lofty gates, to whom his native land
Refused to open hers. Yet shalt thou know,
Ungrateful city, in thine own despite,
That thou hast fostered best thy Dante's fame;
For virtue when oppressed appears more bright,
And brighter therefore shall his glory be,
Suffering of all mankind most wrongfully,
Since in the world there lives no greater name!

With regard to Michael Angelo, no one can have read the preceding short and imperfect narrative of his life, without seeing the cruel and unmerited treatment he experienced from the great; the perpetual and the harassing opposition he met from those who, willing to avail themselves of his genius, and to unite their names and fame with his in the hopes of reaching posterity by this means, were yet unwilling to allow him the free use of his powers, or to brook that independence and freedom that would not allow him to humble himself before their baseness. His feelings may be completely collected both

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of Dante, and amongst the rest an infinite number of the most excellent naked figures in the most striking attitudes. The book got into the hands of Antonio Montanti, an intimate friend of Antonio Maria Silvia, as appears from Silvia's published letters. Montanti was an able statuary, and set a very high value on this book, and on going to Rome from Florence, he sent all his effects by sea, when the vessel and its freight perished—and thus was lost to the world this inestimable volume, which alone would have done honour to the library of the greatest monarch.—The demons in the last judgment, the figures rising from the grave, and the subject of the brazen serpent and the execution of Haman, in the Sistine chapel, all will convince the reader of Dante how kindred his genius was to that of Bonnaroti's, and how worthy the painter was to embody the ideas of the poet; but the work, observes Sig. Radici, in which Michael Angelo truly showed that his mind was, so to speak, an emanation of that of Dante, is the one which is so unlike the production of all other painters, that we may truly say, he was inspired to execute it, viz. of the Virgin looking at her son with dry eyes, the expression of which is far removed from all mourning or sorrow, thus imaging the true and philosophical meaning of that sublime prayer in the last canto of the Paradiso.

O virgin mother, daughter of thy son!
Created beings all in lowliness
Surpassing, as in height above them all.

from his letters and his poetry; and in his madrigal to Riccio, he again expresses his opinion of those by whom it was his lot to be surrounded.

Ill hath he chosen his part who seeks to please
The worthless world,—ill hath he chosen his part,
For often must he wear the look of ease
When grief is at his heart;
And often in his hours of happier feeling
With sorrow must his countenance be hung,
And ever his own better thoughts concealing
Must be in stupid grandeur's praise be loud,
And to the errors of the ignorant crowd
Assent with lying tongue.
Thus much would I conceal that none should know
What secret cause I have for silent woe;
And taught by many a melancholy proof
That those whom Fortune favours it pollutes,
I from the blind and faithless world aloof,
Nor fear its envy nor desire its praise,
But choose my path through solitary ways.

Southey.

We have been induced, notwithstanding the narrowness of our limits, to give these extracts of the poetry of Michael Angelo, not only for their intrinsic beauty, but because we have no better means of showing the constitution of his mind, and making him, in fact, in the most important part of his history, that of his feelings and opinions, become his own biographer.

LETTERS OF MICHAEL ANGELO.

To M. Luca Martini.

Most noble Messer Luca,(1)—I have received from M. Bartolommeo Bettini (2) your letter, enclosing me a commentary (3) upon a sonnet which was the offspring of my pen. The sonnet is verily mine, but the commentary on it is the gift of Heaven; for of a truth it is an admirable production—not by the award of my judgment, but by that of the most able men, and more especially of M. Donato Giannotti (4), who seems as if he could never read it enough, and begs to be specially commended to you. As regards the sonnet, I know what it is: but be that as it may, it is impossible but that I must feel a little vain glory from the circumstance of its having given rise to so beautiful and erudite a comment; and inasmuch as the author of the same pronounces me, by his fine words and praises, to be what I know I am not. Let me beg of you that you will speak for me in return, and in language such as is due to so much affection, courtesy, and love. I do entreat you to this the more from a sense of my own inferiority, and because he who enjoys the good opinion of the world ought not to tempt fortune, it being more wise in him to hold his peace than to get a fall from on high. I am old; and death hath already deprived me of the thoughts of my youth: and let him who knows nothing of old age from experience wait patiently till it arrive, for he can form no opinion of it sooner. Recommend me, as I have said, to Varchi, as one who is most attached to him, and to his virtues, and no less devoted to his service wheresoever I am.

At Rome. M. A. Buonaroti.

To Giorgio Vasari.

My dear Mr. George,—I wrote you nothing about laying the foundations in St. Peter at Montorio, both because the Pope would not give his assent, and because I was aware that you had been informed of it by your man. I will now tell you what followed; which is, that the Pope went yesterday morning to Montorio, and sent for me there (5). I met him on the bridge as he was returning; and at the conclusion of a long conversation I had with him respecting the sepultures, he told me he had resolved not to have them erected over that hill, but in the church of the Florentines. He asked me my opinion, and also with regard to some plans, and I encouraged him much to continue in that intention; thinking that by this means the church will be brought to perfection. As for the three letters which I received from you, my pen is incapable of making due answer to the fine things you say of me; but if it would delight me to be in some part such as you describe me, it would only be because you might thus have a servant worth something. But I do not wonder that you, who resuscitate the dead (6), may also lengthen the life of the living, or for an infinite number of years rescue from death persons who are hardly alive. To conclude; such as I am, I remain all yours.

Rome, Aug. 1, 1550.

To the same.

My dear friend George,—I assure you that, if I could remember how I had arranged the staircase for the library, I should not require so many entreaties. It is true that a staircase comes across my mind as it were in a dream; but I do not think it is exactly that which I originally conceived, because it seems very clumsy. However, here it is. Take a quantity of oval boxes, one span thick, but of different lengths and widths, and put the largest on the pavement, at such a distance from the wall of the door as you wish the staircase to be steep or inclined; then place another box upon that, so much smaller on every side that it may leave sufficient space for the foot to mount, and let the steps go up decreasing in the same proportion until the last perfectly fits the door. Let this oval part of the staircase have two wings, one on each side, continuing the same steps, but not oval. Of this, let the middle serve for the lord from the middle of the staircase upwards, and let the turnings of the wings return to the wall. From the middle down to the pavement they should go, together with all the staircase, about three spans from the wall; so that the basement of the circumference should be nowhere occupied, and every face remain free. I fear you will laugh at what I am writing, but I know you will find something that will do.

Rome, Sept. 15, 1550.

To the same.

My dear Mr. George,—As soon as Bartolommeo (7) arrived here, I went to speak to the Pope; and having seen that he wished to have the foundations of the sepultures laid at Montorio, I provided a mason from St. Peter's. But the busy-bodies (8) having heard of it, would send another instead; and I withdrew immediately, not to contend with him who gives motion to the winds: because, being a man of small weight, I should not like to be blown away into the middle of some bush. I shall only say that, in my opinion, we should no longer think of the church of the Florentines (9). Return soon; and farewell. Nothing else occurs to me for the present.

Rome, Oct. 13, 1550.

To the same.

My dear friend George,—I have derived the greatest pleasure from your letter, seeing that you still remember the poor old man; and moreover, from your having been present at the triumph of the birth of another Buonaroti; for which news I give you my best thanks (10); but I do not like such pomp: for man should not laugh when all the world weeps; wherefore, I think Leonardo should not make those rejoicings for the birth of a child, which should be reserved for the death of one who has lived well. Do not wonder at my not answering you immediately: I have delayed a little, that I might not appear like a merchant. Now, I will tell you, that if I deserved but the least part of the great praise you bestow on me in your letter, I should think that, when I entirely gave myself to you in mind and body, I had given you something, and thus paid some small portion of the great debt I owe to you. On the contrary, I always recognise you as my creditor for a sum much larger than I have means to pay. Being much advanced in age (11), I no longer hope to be able to strike a balance in this world; but I do not despair of doing so in the other. Meanwhile, I beg you to have patience, and I am always yours. Affairs go on much the same!

Rome.

To the same.

My dear friend George,—I call God to witness, that Pope Paul the Third, ten years ago, forced me to take the management of St. Peter at Rome (12), though I was very reluctant to accept it; and if they had continued working at that building, as at that time they did, I should now be so much advanced in the construction of it that I should wish to return amongst you; but from want of money it has been greatly delayed, and is still delayed, when it has just reached the most laborious and difficult parts; so that, if I abandoned it now, I should only lose, with the greatest shame and sin, the fruit of the hardships I have endured these ten years for the love of God (13). I write you this as an answer to yours, and also because I have received a letter from the Duke, which makes me wonder how his grace has deigned to write with so much kindness. I thank God and his excellence for it as much as I can. I wander from the question; having lost both my memory and head, and because writing gives me great trouble, not being my art. The object of this, however, is to make you understand what would ensue if I abandoned the abovementioned building and departed from Rome: I should please several thieves, cause its ruin, and perhaps lose my own reputation for ever.

To the same.

My dear George,—I cannot write with facility (14), but notwithstanding I will say something in answer to your letter. You know Urbino (15) is dead. This was a very great favour that God was pleased to bestow on me, but it caused me also a serious loss, and immense grief. The favour was, that whilst he was in life, he kept me alive; in dying, he taught me how to die, not only without being sorry for it, but to wish for death. I kept him twenty-six years with me, and I have found him very precious to me and faithful; and now that I had made him rich, and that I expected him to be the support and comfort of my old age, he has been taken from me, and no other hope remains but that of seeing him again in paradise; and God gave me an indication of this by the happy death of my companion, who regretted much more than dying the leaving me in this treacherous world amidst so many troubles. My greater part is gone with him, and nothing remains to me but an unbounded wretchedness. I recommend myself to you.

To the same.

My dear friend George,—I have received the little book of M. Cosimo, which you sent me, and I enclose you a letter of thanks to him. I beg you to forward it, together with my compliments. I have lately undergone great fatigue and expense, and also had great pleasure, in the mountains of Spoleti (16), visiting those hermits; so that I returned to Rome less than half myself: because it is really impossible to find peace except in the woods. I have nothing else to say. I am glad you are well, sound in health, and happy, and I commend myself to you.

Sept. 18, 1556.

To the same.

May it please God, Vasari, that, though with great trouble, I may keep myself in life a few years more. I know you will say I am old and silly when I presume to make sonnets; but I am become a child again, just as many people say, and thus you see I am but playing my part. I see from your letter how much you love me; and I assure you I should like to lay my bones by the side of those of my father, as you wish me to do; but in leaving this place at present, I should be the cause of a great ruin to the building of St. Peter, which would be a great shame and a great sin; but as soon as it is carried in a manner that it may no longer be altered, I hope to do as you write me; if it is not already a sin to disappoint a number of greedy cormorants, who anxiously wish for my departure.

To Messer Benedetto Varchi.

To show you in some manner that I have received your little book, I will send you something in answer to your question, though it may tend to show my ignorance (17). I say then that painting seems more esteemed when it most approaches relief, and that relief is thought worse in proportion as it most approaches painting. On this account I used to think that sculpture was the source of light to painting, and that their difference from each other was like that of the sun and the moon. Now, after having read in your little book that part where you say that, philosophically speaking, things which have a common end are the same, I have changed my opinion, and I say, that if superior judgment and difficulty, impediment and labour, do not constitute superior worth, painting and sculpture are the same thing; and, in order that they should be thought such, every painter should consider sculpture as not less than painting, and the sculptor esteem painting equally with sculpture.—I mean by sculpture, that which consists in cutting off: for that which consists in adding, is like painting. I shall only add, that as sculpture and painting proceed from the same intelligence, it would be better to cause them to make peace together, and to give up so many disputes; for people lose more time in them than in making figures. He who wrote that painting was more noble than sculpture would have been surpassed by my own servant, if she had equally known the other things which he wrote. There is an infinite number of things to say about that science, which never were said before; but, as I have said, this would take too much time, and I have very little of it to waste, being not only an old man, but almost in the number of the dead. I therefore beg you to excuse me, and I recommend myself to you, and I thank you as much as I can or know how, for the excessive honour you do me, of which I am quite unworthy.

Rome.

To Messer Bartolommeo.*

It cannot be denied that Bramante was (18) as excellent in architecture as any other man of ancient or modern times. He laid the first stone of St. Peter; not full of confusion, but clear, plain, luminous, and insulated all around, so that it was of no prejudice to the rest of the place, and was held as a beautiful thing, as it is still manifest: so much so, that whoever has departed from the said order of Bramante, as Sangallo did, has departed from perfection; and if any man will but observe his model with unprejudiced eye, the truth of this assertion will be very easily seen. By means of the circle which he makes outside, he takes all the light from the plan of Bramante; and, besides that, he has no light to the numerous hiding-places which he makes below and above the choirs in his own plan, which offers great accommodation to many offenders—such as the hiding of banditti, false coiners, &c.; so that in the evening, when the church is shut, twenty-five persons would hardly be sufficient to find out one. There would also be this inconvenience, namely, that by surrounding the above mentioned work of Bramante with the outside addition of the model, it would be necessary to pull down the Cappella di Paolo, the rooms of Piombo, the Ruota, and many others; nor do I think that the Sistine chapel would remain entire. About the part of the outside circle that has been made, which is said to have cost a hundred thousand crowns, it is not true; for it might be built at the expense of sixteen thousand; and if it were pulled down, the loss would be trifling, as the stones and the foundations could not be better adapted, and the building would be worth two hundred thousand crowns more, and would last three hundred years longer. This is my opinion, and quite an unbiassed one: for if it were adopted, I should lose a great deal by it; and if you can make the Pope understand this, you will do me a great pleasure; for I am not at all tranquil. Yours, &c.

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* Most probably Ammanati, the architect.

To Cosimo, the first Duke of Florence.

Most illustrious Lord Duke,—The Florentines have several times expressed a very great wish to build here in Rome a beautiful church of St. John(19). Now in the time of your most illustrious lordship, hoping to obtain more accommodation, they have resolved to build it, and have appointed a committee, composed of five individuals, who have made me repeated requests and entreaties to let them have a design. As I well knew that Pope Leo had begun building the church above mentioned, I answered them that I would not engage in it without the permission of the Duke of Florence. It since happened that I received a very kind letter from your lordship, which I consider as an absolute order to undertake the construction of that building, which will give your lordship the greatest pleasure. I have already made several plans of it, and the above mentioned deputies have given the preference to one which will be sent to your lordship, and only be executed in as far as may please you. I much regret that I am old (20), and in such discrepancy with life, that I can promise very little concerning this building. I will do with all my heart as much as I can for your lordship, and I recommend myself to you, &c.

Rome.

My Lord Marquis,—It appears that, being in Rome, there was no necessity for leaving the crucifix to M. Tomao, and make him the intermediary between your lordship and me your servant, in order that I may lend you my services, and principally as I have always desired to do more for you than for any other man that I ever knew. But the great occupation in which I have been, and still am engaged, has prevented me from letting your lordship know this. And as I know that you know that love will have no master, and that those who love do not sleep, so there was still less need of such means. And though it might appear that I had forgotten my duty, I was doing what I said I was not, for the purpose of presenting you something unexpected. My plan has failed.

"Mal fa chi tanta fè si tosto oblia."

Wrong does he who so much fidelity so soon forgets.

To Cornelia (21).

I had some apprehension that you were offended; but I could not find out the reason. Now I think I perceive it, from your last letter. When you sent me the cheeses, you wrote me that you intended to send me many other things, but that the handkerchiefs were not yet finished; and in order that you should not go to any other expense for me, I wrote you not to send me anything else, but to ask *me* for something, as I would have complied with your request with the greatest pleasure; for you know, or rather are persuaded of the great affection I still feel for Urbino and what belongs to him, though he is dead. About my coming to see the children, or your sending Michael Angelo here, I must tell you in what situation I am. Your sending Michael Angelo here would not do, because I am without women and without housekeeping, and the child is still too tender, and something might happen which would grieve me much. Besides this, the Duke of Florence is so kind as to press me exceedingly to return to Florence; making me some very generous offers. I have asked him time to settle my affairs here, and to bring the building of St. Peter to a good conclusion; so that I think I shall remain here all this summer, and that, after having arranged my affairs and yours about the mountain of the faith, I shall go to Florence for good, next winter; for I am now old, and I shall have no longer time to return to Rome. I will pass by you; and if you will give me Michael Angelo, I will keep him in Florence with more affection than I have for the children of my nephew Leonard; teaching him what I know, and what his father wished him to know. Yesterday, the 27th of March, I had your last letter.

Rome. M. A. Buonaroti.

To Pietro Aretino.

Magnificent M. Peter, my master and brother,—Your letter caused me pleasure and pain at the same time. It gave me great joy, because it came from you who, in point of merit, stand alone in the world; and it gave me great regret, because, having executed a great part of the subject, I cannot make use of your imagination, which is so powerful, that if the day of judgment had taken place, and you had been present at it, your words could not describe it better. Coming, then, to answer that part of your letter where you offer to write something about me, I beg to say that I shall not only be glad of it, but that I supplicate you to do so, since kings and emperors receive as the greatest favour that of being mentioned by your pen. Meanwhile, if I have anything in my power which may please you, I offer it to you with all my heart. And lastly, do not, for the sake of seeing the picture which I am now making, break your determination of not coming to Rome; for it would really be too much.

LETTERS OF PIETRO ARETINO.

To the Divine Michael Angelo.

In the same manner that not being mindful of God is a spot on one's reputation, and a sin of the soul, so not reverencing you, venerable man, who are a butt of wonders in which the propitious stars strove to dart all the arrows of their favours, would blemish the worth, and dishonour the judgment of those who have any worth or judgment at all. Hence it is the idea of a new nature dwells covertly in your hands, by which the difficulty of extreme lines (a very great science in the subtleties of painting) is so easy for you, who enclose in the extremities of bodies the limits of art; a thing which art itself avows to be impossible to carry to perfection; for extremities, as you well know, should enclose themselves, and then end in such a manner, that, by showing that which they do not show, they should promise things, which the figures of the chapel do promise to those who know how to judge and admire them. Now I, who, with praise and with infamy, have dispatched the greatest portion of others' merits and demerits, not to turn the little I am into nothing, I salute you. I should not certainly dare to do so, if my name, by its being welcome to the ears of princes, had not lost a great deal of its unworthiness; and it is quite right that I should regard you with such reverence, for the world has many kings, but only one Michael Angelo. It is a great wonder that nature cannot hide anything so deeply that it be not found by your ingenuity, or impress in her works that majesty which characterizes the immense power of your style and of your chisel; on account of which, those who see you do not care for not having seen Phidias, Apelles, and Vitruvius, whose spirits were the shadow of your own. But I think it was very lucky for Parrhasius, and other ancient painters, that time has not allowed their productions to live until the present day; whence we still give credit to the doubtful assertions of old panegyrists, and hesitate to grant you that palm which they themselves would give you, by calling you a unique sculptor, a unique painter, and a unique architect, if they were placed on the judicial seat on which we are. But since it is so, why are you not contented with the glory you have acquired? It seems to me that you ought to be satisfied with having surpassed all others by your former productions: but I hear that, with the End of the Universe, which you are now painting, you intend to surpass the Beginning of the World, which you formerly painted, in order that, by surpassing your former performances, you may obtain a triumph over yourself. Who would not tremble at undertaking a subject so terrible? I see, in the middle of the multitude, Antichrist, with an appearance only imagined by yourself: I see terror in the face of the living: I see the signs that the sun, the moon, and the stars give of being about to be extinguished: I see fire, air, earth, and water, as it were, exhaling their spirits: I see apart Nature astounded, and barren, crouching in her decrepitude: I see Time, lean and lingering, which, having arrived at its end, sits upon a dead trunk; and whilst I hear the trumpets of the angels shaking the hearts of every bosom, I see life and death oppressed by a frightful confusion; because the former strives to raise up the dead, and the latter to batter down the living: I see Hope and Despair guiding the troops of the good, and the crowds of the wicked: I see the spectacle of the clouds, coloured with the rays proceeding from the pure flames of heaven, upon which Christ, surrounded with splendours and terrors, sits in the middle of his hosts: I see his face glittering with a serene and terrible light, which fills the good with joy, and the wicked with fear. Meanwhile I see the minister of the abyss, with glory of the martyrs, deriding, with horrible aspect, Cæsar and Alexander, it being much more difficult to conquer oneself than the world: I see Fame, with her crowns and her palms under her feet, thrown on the ground, under the wheels of her cart. Finally, I see the great sentence coming out of the mouth of the Son of God: I see it in the form of two arrows, one of salvation, and the other of damnation; and whilst I see them flying downwards, I hear its fury striking against the machine of the elements, and destroying and solving it with tremendous thunders: I see the lights of paradise and the furnaces of the abyss, dividing the darkness fallen on the surface of the air; so that the thought which represents to me the image of the new day, asks me, if we tremble and fear in contemplating the work of Buonaroti, how shall we tremble and fear when we see ourselves judged by Him who is to judge us? But do you think that my resolution of never seeing Rome again will not be broken by the wish of seeing your picture? I prefer giving the lie to my deliberation, rather than doing wrong to your merits; and I beg you to accept kindly my wish of celebrating them.

Venice, Sept. 15th, 1537.

To the Great Michael Angelo Buonaroti.

As I have no emerald vase like that in which Alexander the Great kept the works of Homer, when Messer Jacopo Nardi, a venerable man, both from age and from wisdom, delivered me your most precious letter, I sighed that your merit is so great, and my power so little: so that, having no nobler place, as soon as I had reverently read it, I placed it with ceremony in the sacred diploma, which I preserve in memory of the high goodness of the Emperor Charles V., in one of the golden cups which the courteous and immortal Antonio da Leyva once gave me. But as it is a pity that you spent such a precious time in answering me, I say that you had already done me too much favour in accepting my letter, which I wrote, not to give you advice in your picture of the Judgment, for it is impossible to imagine anything which is not inferior to your works, but only to encourage you to undertake it. You are certainly a divine person; and thus those who speak of you should make use of superhuman expressions; for, in using common words, they would either show their ignorance, or not say the truth. I receive as a particular favour the permission you give me to write a part of what you know, as I can; and, in order that you may see the beginning, I send you the volume, in which I have in several instances made use of your name, for the purpose of doing honour to myself with its glory. But should not my devotedness obtain from the prince of sculpture and painting a piece of those cartoons which you even give to the fire, that, whilst I live, I may enjoy it, and, when I die, I may carry it with myself into the tomb? I know that the excellence of the friend whom I entreat will not disdain the boldness of my entreaty, both because he is of gentle blood, and because he will not give the lie to the proffers which he made me of himself, and of everything that belongs to him.

Venice, 20th Jan., 1538.

To Michael Angelo Buonaroti.

If the emperor was not as great in glory as in power, I should prefer the joy that filled my heart when Cellini wrote me that my compliments had been agreeable to you, to the stupendous honours which his majesty was pleased to do me; but as he is a great captain as well as a great emperor, I shall say that, on hearing that, I was as much gratified as when his clemency allowed me, the least man in the world, to ride at his right side. But if, by agreement of the public voice, you are reverenced even by those who are ignorant of the miracles of your divine intellect, why should not one believe that you are reverenced by me, who am almost able to understand the excellence of your genius, and whose eyes, without seeing your tremendous and venerable Day of Judgment, were filled with tears of affection? Think, now, how much I should have wept in seeing the production of your sacred hand. If I were so fortunate, I would thank God for having kindly disposed that I should be born in your time, which I repute as glorious as being born in the time of the Emperor Charles. But why, Sir, do you not reward my extreme devotedness to your heavenly qualities, with a relic of those papers for which you care the least? I assure you I would more appreciate two charcoal lines upon a piece of paper, than any cups or chains that this or that other prince ever presented me. Though my own unworthiness should prevent your complying with my wish, I am almost satisfied with the promises of hope. I enjoy them whilst I hope to obtain them; and in hoping them, I contemplate them; and in contemplating them, I congratulate myself on the fortune I have in being contented with the hoped thing, which must one day be converted from a dream into actual vision. You are my idol.

Venice, April, 1544.

Divine Michael Angelo,

Your kindness in sending me your compliments in your letter to Cellini had the same happy effect upon the congregation of my spirits that the sweetness of forthcoming spring has on the troops of birds, when, by a certain silent modulation of pleasure between themselves, they are led to open their throats to harmony. I am, therefore, compelled to seize the pen, and to write to you in the best manner I can; for, as I ought, I cannot: and in writing, I must confess that I am not surprised at your not having fulfilled your promise by the present of some drawings; for people who do not obtain what they wish, should attribute the cause of their disappointment to their wishing what they ought not to wish. The eagerness of our desires sometimes leads us to wish for things which do not suit our condition; so that the power, which is placed in others' will, often causes our disappointment, as just happens to me, on account of seeking for figures, which the halls of kings are hardly worthy to possess. I, however, deserve to be punished with the enjoyment of them; for it is not permitted that you, the possessor of the infinite gifts of which heaven has been kind to you, should be so avaricious of them, seeing the devotion that the people of this world show for them. But if there are persons who have some title to have a share in them, I am certainly of the number; for nature infuses so much power in my writings, that she promises to carry their merits to all places and to all times: therefore you should at last satisfy my expectation with the reward that I have been so long wishing; not because I believe myself such, as pride has just incited me to boast myself, but because I long too much to pourtray some of the wonders continually produced by the divinity which presides over your intellect.

Venice, April, 1545.

Messer Michael Angelo,

Mr. Antonio Anselmi, a true tongue of your praise, and soul of my affection, besides presenting you the regards of myself, who adore you, will excuse neither more nor less the importunity with which I pursue you, from my extreme wish of obtaining some of those drawings of which you are so prodigal to the fire, and so avaricious to me.

Venice, April, 1546.

NOTES.

Letter to Luca Martini.

(1.)—Luca Martini was a member of the Florentine Academy, a very lively burlesque poet, and a great friend of Michael Angelo.

(2.)—Bottari says that the Bartolommeo Bettini here mentioned is the same who wrote the memoirs upon which Varchi compiled his history.

(3.)—The commentary was written by Varchi.

(4.)—Domenico Giannotti was a very wise and intelligent Florentine, elected secretary of the *Dieci di Libertà*, in competition with the great Machiavelli, at the time when Florence was under her popular government. It was at his request that Michael Angelo made, for Cardinal Ridolfi, that head of Brutus mentioned by Vasari.

Letter to Vasari.

(5.)—Julius III. wished to build in the church of St. Peter at Montorio, a marble chapel with two sepultures, one for Cardinal Antonio de' Monti, his uncle, the other for Messer Fabiano, his grandfather; and having ordered Vasari to make the plans of it, he afterwards requested Michael Angelo to fix its cost. When this was done, Vasari begged the Pope to induce Michael Angelo to take the superintendence of the works, and Michael Angelo willingly condescended to do so, from his great affection to Vasari; who soon afterwards left him also the care of laying the foundations, having been obliged to go to Florence. Whilst Michael Angelo was preparing the foundations at Montorio, the Pope changed his mind, which happened by the interposition of Messer Bindo Altoiti, who advised his holiness to have the sepultures and the chapel in the church of San Giovanni, in the hope that by these means that church would at last be brought to perfection. As Vasari says that Altoiti had informed him that he would have done so, and asserts besides that Michael Angelo had also been informed of it, one can hardly understand what he means by saying that the Pope *would hear nothing about it.* It would appear that Buonaroti had tried to keep the Pope in the same resolution, whilst Vasari also says, that Michael Angelo had promised to support the project of Messer Bindo, as he actually writes he did, and for reasons which it was useless to write about, since, if they had settled the matter together, Vasari must have known them. It is most likely that Michael Angelo was not informed of anything, and that Altoiti conceived his plan of inducing the Pope to build the chapel in San Giovanni of the Florentines whilst Vasari was absent from Rome.

(6.)—He calls Vasari *resuscitator* of the dead, because he had just published his Lives of Painters, Sculptors, and Architects, of which the first edition was made by Torrentino in 1550.

(7.)—Bartolommeo, see note 2.

(8.)—M. Angelo calls *Tante cose*—so many things (meaning a busy-body)—Messer Pietro Altoiti, Bishop of Forli; and he gives him that sneering title, because he was eager to have his hands in every thing.

Second Letter to Vasari.

(9.)—Whilst the Florentines were endeavouring to collect money to finish the church, some difficulties arose which prevented Altoiti's project from being executed.

After Vasari, together with Bartolommeo Ammanati, a Florentine sculptor and architect, had procured from Carrara a large quantity of marble for the construction of the chapel at Montorio, Bartolommeo went to Rome to work at them. Buonaroti had proposed him instead of Raffaello, the sculptor from Montelupo in Tuscany, whom he would not allow Vasari to employ, on account of his unbecoming behaviour in the formation of the statues for the sculptures of Julius II.

Third Letter to Vasari.

(10.)—Michael Angelo sent this letter in answer to Vasari, who had informed him that his nephew, Leonard, had just had a son, whom an honourable train of noble ladies had accompanied to baptism. Leonard announced to him also the same news, and Michael Angelo wrote him another letter, of which the original is preserved in the Vatican manuscripts:—"Leonard," says he, "I learn by your letter that Cassandra has made you a present of a beautiful son, whom you intend to call Buonaroto. This, as well as Cassandra's quick recovery, gave me the greatest pleasure. God be thanked for it! and may he be pleased to make him good, that he may do honour to our house, and sustain it. Thank Cassandra, and remember me to her. The only thing that remains to do, is that about which I wrote you some months ago,—if you should meet with a respectable and well-situated house for sale, to let me know; and thus I write you again, that if such a house should present itself, you must not fail to inform me. If you do not think it unseasonable, you might look for it now.—From Rome."

(11.)—Michael Angelo did not call himself old without reason: he was at that time in his eightieth year.

Fifth Letter to Vasari.

(12.)—Condivi says that Michael Angelo exercised the profession of architect with reluctance; and that when Antonio da San Gallo, the architect of St. Peter, died, Pope Paul III., seeing that, in spite of all his entreaties, Michael Angelo declined to undertake the work, alleging that architecture was not his art, at last took the resolution to command him; giving him, however, very ample powers, which were afterwards confirmed by Julius III.

(13.)—If Michael Angelo *worked for the love of God*, or *gratis*, it was his own fault, and not because the Pope had refused to remunerate him. Condivi says that Michael Angelo never would accept anything for his services, and had required it to be so specified in the agreement. The Pope, notwithstanding, sent him once a hundred crowns of gold by Messer Pier Giovanni, the Bishop of Forli, then the chamberlain of his holiness, as his salary for a month, on account of the fabric; but Michael Angelo refused them, saying that he had made a different agreement, and he sent them back. The Pope was angry; but Michael Angelo was not to be moved from his resolution.

The words with which that great Pope expressed himself, when he granted Michael Angelo the ferry of Piacenza, (which Vasari wrongly calls Parma,) are the following:—"The happy memory of Clement VII., our immediate predecessor, first, and then ourselves, being desirous to remunerate and satisfy you for the picture to be made on the wall of the altar of our chapel, representing the history of the Last Judgment; considering your labour and your merits, with which you amply adorn our age, we promised, and still promise you by the present brief, the yearly income of 1200 golden crowns during your life; and in order that you may continue and bring to an end the said work which you began with our apostolical authority, by virtue of the present brief we grant you, during your life, the ferry on the Po, near Piacenza, enjoyed by Francesco Burla, when he was living, with the usual emoluments, jurisdictions, honours, and duties, as a part of the said income promised to you, viz. for 600 golden crowns, the sum we hear the said ferry annually yields, continuing our promise, as regards the other 600 crowns during your life; ordering our vice-legate of Cispadane Gaul, who is there now, and those who may be there in future, and our beloved children, the Anziani and the corporation of the said town of Piacenza, and all others whom it may concern, to give you or your agent the possession of the said ferry, and the exercise of the same, and to maintain you in it, after having given it to you, and to make you enjoy peacefully this concession during your life, notwithstanding anything to the contrary, &c. Rome, 1st Sept. 1535, the first year of our pontificate."

(14.)—Michael Angelo said also that writing was not his art, and besides that, on this account, he often declined answering by letter. He also left off writing a work on drawing, which would have been of that utility to art which it is easy to imagine. Whilst, however, he said he could not write, he composed some most beautiful verses; and his letters themselves are more than sufficient to prove that he might have become an excellent prose writer, if he had but chosen to attend to it.

Sixth Letter to Vasari.

(15.)—This Urbino was a Francesco Amatori from Urbino, whom Antonio Franzese had placed with Buonaroti in 1530. When Antonio Mini, pupil of Buonaroti, went to France, Francesco began to serve him in a very praiseworthy manner, and he continued to do so for twenty-six years, until Michael Angelo, as Vasari says, *made him rich*. He gave him a great deal of money, even 2000 crowns at one time; and besides that, he obtained him the place of guardian of the pictures of the Sistine chapel, for which he received from the apostolical treasury four crowns every month, with an addition of six monthly ducats of gold for life. His duty was, as expressed in the *moto-proprio* of Paul III., to preserve from dust and other dirt the pictures of the ceiling already made in the Sistine chapel, and the other pictures and ornaments of the chapel and halls built by the said Pope, and also to preserve them from the smoke of the lights which are used for the celebration of divine offices. When Francesco died, Vasari wrote Michael Angelo a letter of consolation which was answered by the present.

Seventh Letter to Vasari.

(16.)—This letter was written by Michael Angelo to Vasari, after his return from Spoleti, where he had fled a short time before the French army approached Rome.

He mentions Messer Cosimo Bartoli, the curate of St. John of Florence, a very learned man, and a member of the Florentine academy, who published the book called a "Defence of the Florentine Language, and of Dante," which Charles Lenzoni, a learned member of the same academy, whilst dying, ordered Giambullari to inscribe to Michael Angelo.

Letter to Varchi.

(17.)—Though Vasari says he speaks as an ignorant man, it seems he says in these few words much more than many learned men, who, in spite of the opinion of such a man, would continue to lose their time in writing about a question of no utility. Buonaroti always considered it as such; wherefore, when he was questioned by Vasari, he answered sneering, "that sculpture and painting have the same end, obtained with great difficulty on both sides; and he could draw no more from him."—*Varchi, Two Lectures*, &c.

Letter to Messer Bartolommeo.

(18.)—Bottari says, that this letter is in the possession of the heirs of Michael Angelo, and is written to a friend of his whose name is not mentioned.

"The model of Antonio San Gallo is very large, and is still preserved at Belvedere."—*Bottari.*

Bottari says "he mentions the Paoline chapel, the room where the bulls are sealed, and the hall where the auditors of Rota assemble. It may be observed, that whilst Michael Angelo speaks here of Bramante with the praise that was due to him, when he went to the Pope, Julius, to complain of him, he did not refrain from criticising him much also about architectural matters."—*V. Condivi.*

Letter to the Grand Duke.

(19.)—Pope Leo had also made that church the parish of the Florentines, who lived at Rome even from the year 1519.

(20.)—Michael Angelo was very old, and as he could not make plans for architectural drawings, he employed Tiberio Calcagni, a gentlemanlike and prudent person: he therefore ordered Tiberio to make the plan of the place of the church; and whilst people thought that he was doing nothing, he sent word to the deputies that he had served them. In fact, he had not only prepared one plan, but five, and all very beautiful, and the deputies chose the richest. It may appear strange that Michael Angelo made his models with clay; but, as a sculptor, he was more experienced in clay than in anything else. Benvenuto Cellini says, that Michael Angelo being once desirous to show some stone-cutters some shapes of windows, before he proceeded to show them by drawings, he made them also with clay.—*Varchi, Two Lectures*, &c.

Letter to Cornelia.

(21.)—Bottari thinks that this Cornelia was the wife of Urbino, and Michael Angelo's *Comare;* and that the Michael Angelo here mentioned was her son, godson of Buonaroti.

STUDIES OF M. ANGELO.

The original studies of M. Angelo for many of his great works are still remaining, and were executed in different styles. The original design was sketched in merely to show the composition and effect of the figure, and was executed with a boldness and firmness which nothing but the hand of such an artist could express, whilst the finished and corrected drawing, executed in pen, shows the most masterly knowledge of nature, and power of correct design, as well as knowledge of the anatomy of the figure.

Extract from Hayley's Life of Romney.

"It is probable that his professional writings, mentioned by his scholar Condivi, have perished; although Gori, in his notes on Condivi, probably meant to include them in his enumeration of Michael Angelo's writings; namely, 'I Ragionamenti, le Lettere, e le Rime.' I conclude the Ragionamenti to be lost, as they would not otherwise have escaped the researches of M. Angelo's last and very accurate and zealous biographer. It may, however, gratify the curious to observe that some notice of them may be found in the work of a Florentine (Vicentio Carduchi), who rose to considerable eminence as a painter in Spain. He published at Madrid, about seventy years after the decease of M. Angelo, 'Dialogues upon Art between a Master and his Disciple,' in the Spanish language. In the commencement of the work, the disciple enumerates the treatises he read for the acquisition of professional knowledge. After naming those of Albert Durer, Leon Battista, Alberti, and others, he mentions 'Algunos Discursos Manuscrittos doctissimos de Michael Angel.' I do not recollect any later trace of such compositions; but this seems to prove that, in 1633, they still existed. It is remarkable that they are not mentioned by Vasari, who has not failed to declare that he heard his illustrious master and friend utter many admirable observations on art, which he, Vasari, intended to preserve and publish in the form of a dialogue; an intention that his editor Bottari says he never fulfilled."

Sculptors—Successors and Contemporaries of M. Angelo.

Baccio Bandinelli was one of M. Angelo's contemporaries, and to whom he was opposed. His works are bold, and the design vigorous, though mannered. Several of his works exist at Florence. Benvenuto Cellini, one of the most amusing writers of his time, was also an eminent sculptor of the same age; and though more generally known for his smaller works, still his "Perseus at Florence," which is the best of his larger works, proves him to have been one of the most distinguished artists of his time.

In mentioning the celebrated sculptors of his time, Propertia da Rossi, one of the most beautiful and accomplished women of her times, and who died in the flower of her age, must not be omitted. She executed some statues for the façade of a church at Bologna.—*See* Vasari.

Giovanni da Bologna was celebrated for his facility and freedom; but the art had taken leave of repose and simplicity. His bronze statue of Mercury, however, known all over the world, will always be regarded as the most elegant and poetical production of modern art.

Bernini, who was born at Naples, was an artist of the greatest promise, though, with the exception of the beautiful groupe of Daphne and Apollo, what he did seemed to subvert all true taste in sculpture; and with him began the style which ended with the French school, consisting of strained actions, uncommon arrangement of composition, and flying draperies, till statuary became a work of ingenuity and dexterity, rather than an art.

ANECDOTES OF MICHAEL ANGELO,

With some examples of what are termed his "good sayings."

It has been observed by some moralists, that the various qualities in any human character are so many elements forming one harmonious whole; whatever therefore serves to throw further light upon the minds of distinguished persons may be considered valuable as well as curious. It is for this reason, in order to afford a more distinct delineation of the lofty genius, the noble feelings, and the magnanimous disposition of the great man whose life and works form the subject of the preceding pages, that we now subjoin such of the sayings and the anecdotes attributed to him by Vasari and other biographers as do not happen to have been already noticed in the course of the foregoing narrative.

Such, we are told, was the natural kindness and the benevolence of his disposition, (and it has been frequently mentioned to his honour,) that he was known to distribute considerable sums, by way of dowry, to young unprotected females or orphans, to defend them from the fate usually attending indigence and its exposure to vice. To his nephew likewise, whose circumstances were extremely circumscribed, he made frequent advances of money, as much, it is said, as three, and, some writers add, even as ten thousand ducats on the same day.

Pleased with the devoted attention of an aged domestic who attended his latter years, and who died before his master, M. Angelo one day asked him, "What was likely to become of him, should he himself be suddenly cut off?" "Alas, Sir," replied the old man, "I should be compelled to look for another service." "That you shall never do, my good Urbino; I will preserve you from the necessity of such a step;" and he presented him with 2000 crowns.

Though ever busily engaged in the world, solitude was not without its charms to a mind like Michael Angelo's. He once retired, as related in his Life, to the mountains of Spoleto, and when charged with his love of seclusion, he used to observe, that his art was a jealous mistress, and would only be content with the most devoted and exclusive love.

So great was the attachment which he felt throughout life for sculpture, that it continued undiminished to extreme age; and when no longer able to walk, it is said he caused himself to be conveyed into the court of the Belvedere, to contemplate the beauty of the statues. It is even asserted, that, when no longer able to see, he was accustomed to examine their proportions with his hands, and that he never retired without embracing them.

In the cabinet of the Grand Duke of Florence is still preserved an unfinished head of Brutus, stated to have been abandoned by the illustrious artist during its progress, "lest," as he observed, "he should be thought to give countenance to the parricidal crime of that celebrated Roman, by endeavouring to perpetuate his memory in the minds of posterity." At the foot of the intended bust is to be read the following Latin distich:—

Dum Bruti effigiem sculptor de marmore ducit,
In mentem sceleris venit, et abstinuit.

As from the stone the features start to view,
The sculptor paused, and from his task withdrew.

While Raphael was employed in one of the chambers of the Farnese Palace, M. Angelo is reported to have inspected the work in that artist's absence. But without observing what he thought of his rival's labours, he sketched the head of a fawn upon the wall, in a far bolder style and nobler proportions than the figures which he saw around him. No sooner had Raphael, on his return, become aware of it, than he exclaimed, that it could only be the work of M. Angelo. It is added, that the younger artist availed himself of the tacit reproach it seemed to convey, by enlarging his own manner, and also that, with becoming reverence for superior genius, he chose rather to leave his own labours incomplete, than to erase that noble head, which is said to be still carefully preserved.

Sebastian del Piombo, who was no admirer of painting in fresco, induced Pope Julius II. to lay his commands on M. Angelo to paint the façade of the chapel of the Vatican in oil, which the noble artist as resolutely declined to do. At length, on being much pressed, he said, with some degree of warmth, "No—never! that is an employ fit only for idle persons or women!"

Another anecdote, but perhaps hardly so well authenticated as the last, is told of the same parties. It would seem that Julius, impatient to see the progress of the artist's labours, to which the latter was always extremely opposed, obtained admittance to the chapel when it was presumed M. Angelo would be absent. Angry at beholding spectators present against his express injunctions, and not aware of their dignity, the artist suddenly threw down a plank of the scaffolding, which, falling from one stage to the other with a terrible noise, caused such an alarm, that the Pope got out of the place as quickly as possible, and was careful how he renewed his private view of the great painter's unfinished labours.

In his great picture of the Last Judgment, it is said that M. Angelo introduced the portrait of a cardinal, whom he extremely disliked, into his representation of the infernal regions, and that it was so like him as to be easily recognized. The Pope saw it, and interceded for the poor cardinal, in order that it should be effaced, when M. Angelo is reported to have replied, that unfortunately he could not oblige his holiness, which he could have done had the cardinal only been placed in Purgatory, but that being in Hell, there was no redemption for him.

Upon being one day informed that the Pontiff, Paul IV., had been observing upon the nudity of the figures in the Last Judgment, and had desired that they might be retouched for the sake of propriety: "The Pope would do better," replied the painter, "to occupy himself with correcting the disorders and indecencies which disgrace the world, than with any such hypercriticisms."

A Florentine citizen having observed M.

Angelo one day stop at the San Michele to behold a statue of St. Mark executed by Donato, and inquiring of him what most particularly struck him in its appearance, the sculptor is reported to have replied, "It is the character of the good man, which I have nowhere seen surpassed; and if St. Mark was all that he is here represented, you need have no difficulty as to believing every thing which he wrote."

A certain painter having completed a work with extreme care, and taken yet more to derive a considerable profit from its exhibition, M. Angelo was asked what he thought of the author of it: "I think," was the reply, "that he will be a *poor fellow* so long as he shows such an extreme eagerness to become rich."

One of his early friends, who had entered the church, having arrived at Rome, waited upon M. Angelo in the splendid dress in which he had officiated at mass; but the latter, affecting great surprise, appeared not to recognize him. When informed by the young dignitary who he was, Michael, fixing his eye with a look of admiration upon his canonical finery, joyfully congratulated him, exclaiming, "Heavens! what a fine outside! if you be only half as beautifully decorated within, it must go well with your soul!"

Being desired by one of his friends to give his opinion of a sculptor who had imitated a number of the most celebrated antique figures in marble, and who boasted that he had even gone beyond the skill of the ancients, M. Angelo answered with a smile, "He who walks behind others can never go ahead of them; and the man who cannot do well without foreign aid, can never do any thing good even with the help of others."

A certain painter exhibited a work in which the figure of an ox was drawn, in a manner superior to any other part: and a spectator expressing his surprise at it, the great artist observed, that "There was no painter but could make a good portrait of himself."

On one occasion a sculptor, who had just finished his work, evinced a particular anxiety to throw the light into his rooms in such a manner as to exhibit the piece to advantage; but M. Angelo observed to him, "Do not give yourself this needless trouble; the light of the public square will best put its merit to the test;" alluding to the popular appreciation of its character.

A painter of the day exhibited a history-piece, in which there was scarcely a stroke of original power, the several parts having been made up of imitations of various designs and sketches by other hands. M. Angelo being asked his idea of it—"He has done well," was the reply, "not to copy from himself; but he will be awkwardly situated at the day of judgment, when all are to resume what belongs to them: for what will become of his unfortunate picture?" a saying by which he doubtless intended to convey his opinion of the necessity of self-reliance, and the cultivation of an artist's own powers.

LIVES OF M. ANGELO.

The Abbé Hauchecorne's Life of M. Angelo. 1783.

Giuseppe Piacenza has added a long account of M. Angelo in the third volume of his Life of Baldinucci; and Cicognara, "Storia della Scultura," has devoted a large portion to the works of M. Angelo and the events of his life.

Giorgio Vasari, Life of M. Angelo in his Lives of Painters, Sculptors, and Architects. 1550.

Condivi, Life of M. Angelo. Bottari, Life of M. Angelo. M. Duppa, Life of M. Angelo; and Notices by various historians and critics.

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